

ARCHAEOLINGUA

Edited by
ERZSÉBET JEREM and WOLFGANG MEID

Volume 45

THE YAMNAYA IMPACT ON PREHISTORIC EUROPE

Volume 4

Series editor
VOLKER HEYD

STEPPE TRANSMISSIONS

Edited by
Bianca Preda-Bălănică and Marja Ahola



BUDAPEST 2023

The publication of this volume was funded by the University of Helsinki and the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation program, under grant agreement no. 788616 – The Yamnaya Impact on Prehistoric Europe (YMPACT).



Front Cover

Silver hair rings from Kamen – *Gabrova Mogila*, Sliven region, Bulgaria.
Courtesy of Diana Dimitrova and The National Archaeological Institute with Museum –
Bulgarian Academy of Sciences, Sofia. Photo credit: Krasimir Georgiev

Back Cover

Bronze Age burial mound from Prahova County, Romania.
Photo credit: Bianca Preda-Bălănică

ISBN 978-615-5766-62-6

HU-ISSN 1215-9239

HU-ISSN 2786-2968

© The Authors and Archaeolingua Foundation

All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording or any other information storage and retrieval system, without requesting prior permission in writing from the publisher.

2023

ARCHAEOLOGIA ALAPÍTVÁNY

H-1067 Budapest, Teréz krt. 13.

Cover design: Móni Kaszta

Copy editor: Bianca Preda-Bălănică

Desktop editing and layout by Rita Kovács

Printed by AduPrint Kft.

Contents

BIANCA PREDA-BĂLĂNICĂ – MARJA AHOLA	
Preface	7
ALEXEY G. NIKITIN – SVETLANA IVANOVA	
Long-distance exchanges along the Black Sea coast in the Eneolithic and the steppe genetic ancestry problem	9
NATALIA SHISHLINA – ALEXEY KAZARNITSKY – NADEZHDA LEONOVA – OLGA KUZNETSOVA – VYACHESLAV SEVASTYANOV	
Yamnaya group from the Peschany IV burial ground in the Lower Don Eurasian steppes: local or non-local?	29
VALENTIN DERGACHEV	
Budzhak “Culture” through the prism of the cartographic method	45
CRISTIAN EDUARD ȘTEFAN – GABRIEL VASILE – RADU PETCU – ANDREI HEROIU – BIANCA PREDA-BĂLĂNICĂ – MARTIN TRAUTMANN	
The Bronze Age mounds from Aliman (Constanța County, Romania)	95
STEFAN ALEXANDROV	
More about a particular group of Early Bronze Age barrow graves in Hocker position from North-East Bulgaria	135
MASAO SEMMOTO	
Tracing the root of cord decoration on Early Bronze Age pottery in Upper Thrace	163
TODOR VALCHEV	
Foreign-local interactions during the Early Bronze Age in the valley of Tundzha River and the new ways of presenting prestige	191
HORIA I. CIUGUDEAN – COLIN P. QUINN – CLAES UHNÉR – JESS BECK	
From West to East and East to West: Yamnaya Migration and Interaction with Copper Age/Early Bronze Age Carpathian Communities in Transylvania	205
JAROSLAV PEŠKA	
East European elements in burial rites of the Moravian Corded Ware Culture. Wagon burial in Moravia in the 3 rd millennium BC?	247
SEBASTIAN SCHULTRICH	
The Emergence of the Corded Ware Culture in Northern Central Europe	281
HENK VAN DER VELDE – NIELS BOUMA	
Change or continuity in burial traditions between the TRB period and the Corded Ware culture? The case of Dalfsen, a Neolithic burial ground in the Netherlands	305
List of contributors.....	323

Preface

This volume, the fourth of the *Yamnaya Impact on Prehistoric Europe Series*, represents the proceedings of an EAA session held in 2020. The 26th Annual Meeting, initially planned to take place in Budapest was transformed into the first Virtual Meeting organised by the European Association of Archaeologists due to the Covid-19 pandemic. The session had the title *#196 No man travels alone, he takes himself along: Yamnaya transmission and/or transformation during the 3rd millennium BC Europe*, and was co-organised by the two editors of this volume together with colleagues Todor Valchev from the Yambol Regional Historical Museum (Bulgaria) and Piotr Włodarczak from the Institute of Archaeology and Ethnology of the Cracow branch of the Polish Academy of Sciences (Poland).

The idea of the session emerged from critical debates around the arrival of the Yamnaya steppe populations in southeastern Europe at the end of the 4th and the very beginning of the 3rd millennium BC. Current research, especially fuelled by recent aDNA studies, suggests that large-scale migration took place and triggered irreversible processes of change in biological ancestry and culture in Europe. A clear-cut scenario has been popular in the past couple of years: the Yamnaya came, conquered the locals and their descendants created phenomena apparent in the archaeological record, of which the Corded Ware Complex was the most prominent example. However, was it this simple? We were already wondering about this by 2020. The latest research has challenged the initial aDNA assumptions regarding the relationship between the Yamnaya and the Corded Ware complexes, as well as estimations of the actual amount of migration and violence involved. Furthermore, from an archaeological perspective, it is still unclear how the process of interaction and networking has unfolded in various regions of Europe.

Thus, the session aimed to shift the focus from genetics to archaeology, and analyse the material culture and ritual practices to explore how steppe transmissions occurred during the 3rd millennium BC. Since most of these phenomena are known especially through burial assemblages, our focal point was mortuary archaeology. Accordingly, we aimed to explore the similarities and differences seen within the mortuary remains of Yamnaya and previous, contemporary, and subsequent archaeological complexes of the 4th and 3rd millennia BC.

The volume presents the work of 25 researchers from Bulgaria, the Czech Republic, Finland, Germany, Ireland, Japan, Moldova, the Netherlands, Norway, Romania, Russia, Ukraine, and the United States, united in 11 articles. The themes discussed cover a wide region of the European continent, from the Lower Don steppes in the east to Northern Central Europe in the west, and a time span of approximately two millennia.

Approaches to the mortuary archaeology of the 4th and 3rd millennia BC societies show a diversity of methodologies. Some studies have analysed extensive regions, such as the article by Alexey Nikitin and Svetlana Ivanova, dedicated to long-distance exchanges along the Black Sea coast in the Eneolithic. Others provide an overview of latest research about the chronological phases and ritual characteristics of the Yamnaya Culture in well-defined geographic regions, such as the article of Valentin Dergachev focused on the steppe region between the Prut and the Dniester, or Horia Ciugudean's article in collaboration with colleagues, investigating the presence of Yamnaya communities in Transylvania and, particularly, their interactions with local societies. We also have to mention Sebastian Schultrich's contribution regarding the emergence of the Corded Ware Culture symbols and new ancestries in Northern Central Europe, facilitated by existing super-regional networks and identities during the Late Neolithic.

Other studies have focused on the transmission of specific components of burial practices or material culture items. Such is the study of Stefan Alexandrov on the possible origins of a particular group of crouched burials present in northeast Bulgaria between 3300 and 2900 BC. Here, we also have to

mention the study of Masao Semmoto concerning the transmission of cord decoration on Early Bronze Age pottery in the Upper Thrace, as well as the article of Todor Valchev about new ways of presenting prestige through the display of weapons and ornaments such as daggers and hair rings. Similarly, the article of Jaroslav Peška advances the hypothesis of wooden four-wheeled ceremonial wagons, similar to those in the wider Black Sea region, being used for the burial of some individuals in the Moravian Corded Ware Culture.

Finally, some studies were dedicated to valorising the research potential of particular archaeological sites, such as the mounds from the Peschany IV burial ground in the Lower Don Eurasian steppes, presented by Natalia Shishlina and colleagues. Another example is that of the burial mounds excavated in Aliman, Romanian Dobroudja, presented by Cristian Eduard Ștefan and collaborators. Furthermore, Henk van der Velde and Niels Bouma have taken the case study of the Neolithic burial ground from Dalfsen, to investigate change or continuity in burial traditions between the Funnel Beaker period and the Corded Ware culture. We hope that the research covered in this volume will contribute to further fruitful discussions and open new perspectives on the micro-regional traits, regional particularities, and supra-regional complexities of steppe transmissions in the 4th and 3rd millennia BC.

At the end of this brief introduction, we express our gratitude to those who made the publication of this volume possible. We thank the authors for their contribution to this volume. We thank our colleagues Todor Valchev and Piotr Włodarczak for co-organising the EAA session at the Virtual Meeting in 2020 and for their support during the peer-review process. We thank the anonymous reviewers for their valuable feedback and insights that helped improve the articles. We would like to thank Stefan Alexandrov for kindly providing the illustration of the book's front cover. We would also like to thank Professor Volker Heyd from the University of Helsinki, who offered us the possibility to publish this volume in the *Yamnaya Impact on Prehistoric Europe Series*, and to Erzsébet Jerem, Rita Kovács, and Katalin Sebők from the Archaeolingua Foundation, Budapest, for their professionalism.

Bianca Preda-Bălănică & Marja Ahola
The Editors

Long-distance exchanges along the Black Sea coast in the Eneolithic and the steppe genetic ancestry problem

ALEXEY G. NIKITIN – SVETLANA IVANOVA

Abstract

The appearance of steppe genetic ancestry in the 3rd millennium BC in Europe coincided with the beginning of a new cultural and economic era dominated by pastoralist economy and progressively more centralized social institutions. These genetic and socio-cultural elements were brought to Europe by the descendants of the Eneolithic inhabitants of the Ponto-Caspian steppe. The details of the formation of the steppe genetic package and the identity of the contributors of its genetic components remain elusive. We propose that steppe genetic ancestry, as well as the cultural attributes that characterize the Early Bronze Age steppe pastoralists such as the Yamna(ya) (Pit Grave) culture complex, formed as the result of activities in connection with the circum-Pontic trade network. A millennium-long association among the Eneolithic cultures of the Ponto-Caspian steppe and forest-steppe, the eastern Balkan cultures of west Pontic, and populations of the Caucasus and northeast Anatolia, led to the integration of the elements of genetics, subsistence strategies, material culture, and worldview, to produce the foundation of a novel genetic and socio-cultural phenomenon by the last third of the 4th millennium BC.

Key words: Eneolithic, Ponto-Caspian steppe (PCS) genetic ancestry, Circum-Pontic trade network, Serebnii Stih, Usatove, Yamna

Introduction

In the 3rd millennium BC a major change in cultural, economic and genetic makeup took place in Europe. A genetic package associated with the nomadic cultures of the Ponto-Caspian steppe spread over most of continental Europe by the middle of the 3rd millennium BC. This genetic package is most commonly associated with a cultural conglomerate known as the Yamna (Yamnaya, Pit Grave) complex that formed during the last third of the 4th millennium BC in the steppes between the lower Volga and the lower Dniester. The Yamna genetic package consisted of ancestries of three distinct origins, not seen together in one population group until the Yamna. How and why the genetic and cultural package of the Yamna was formed is unclear. A considerable effort has gone into trying to solve this problem, yet a clear answer is still lacking. In the opinion of the authors, an extensive circum-Pontic trade network that formed since the early 5th millennium BC laid the genetic and cultural foundation for the emergence of the Yamna and the Indo-European cultural package in the Early Bronze Age (EBA).

Climate change and population transformations in Europe

Post-glacial Europe experienced three major genetic turnovers (NIELSEN *et al.* 2017). First turnover took place around the end of the last Glacial, when humans who retreated to various regional glacial refugial

zones at the height of the Last Glacial Maximum, spread out to re-populate Europe. The two subsequent genetic turnovers were associated with intercontinental migrations in the last 8000 years, which reshaped the cultural and subsistence practices in Europe. They also significantly shuffled the genetic ancestry of prehistoric Europeans. Both migration events were associated with major climate changes.

One of these climatic transformations took place about 6500 BC, when the Earth's atmosphere finally stabilized after the post Ice-Age fluctuations and the Atlantic Climatic Optimum had insured. Starting at about 6200 BC, a massive migration took place from central Anatolia, one of the world's major centers where agriculture evolved, to southern and, subsequently, central Europe. The onset of this migration coincided with a significant arid event ca. 6300–6000 BC in the circum-Pontic area (KOTOVA – MAKHORYKH 2010). The second migration wave of the out-of-Anatolia farmers reached the outskirts of Vienna in modern-day Austria by about 5750 BC (NIKITIN *et al.* 2019). By the end of the 6th millennium BC, Anatolian genetic ancestry became dominant throughout Europe, replacing the autochthonous European hunter-gatherer (HG) ancestry to a large extent. As farming communities expanded in Europe, the range of European HGs became more and more restricted to the coastal areas of the Baltic and the Black Seas, not suitable for large-scale farming due to the climatic conditions that were either too cold or too dry (MALMSTRÖM *et al.* 2009; IVANOVA – NIKITIN 2012).

European HG populations nevertheless thrived in the coastal areas, relying on fishing as the main subsistence mode. Such as, fisher communities living along the southern stretch of the Dnipro River in southeast Ukraine were able to flourish along the fish-rich Dnipro Rapids for millennia, without a significant change in their subsistence or cultural/ritual practices. These populations maintained a homogenous genetic pool, derived from HGs of eastern European Plain and adjacent areas (Eastern Hunter Gatherers, EHG). In the Neolithic, the Dnipro Valley HGs received an influx of Western Hunter Gather (WHG) genetic ancestry (MATHIESON *et al.* 2018) from the southwest of the Carpathians. Eastern HG ancestry also characterized the populations of the Volga-Ural area, in the steppes north of the Caspian Sea (HAAK *et al.* 2015).

In the classic atmospheric chronology of the Holocene, the period between ca. 6500 and 3500 BC corresponds to the Atlantic chronozone (ANDERSON – GOUDIE – PARKER 2007). This Atlantic climatic optimum is characterized by a generally warmer and wetter climate (ANDERSON – GOUDIE – PARKER 2007), favorable for agricultural practices. Around 5000 BC, a warm period precipitating the lower Peron transgression, led to the rise in sea levels and a general warm-up of atmospheric temperatures. Around 4900–4500 BC, the coastal areas of southeast Europe such as the Danube Delta witnessed a significant increase in population density (CAROZZA *et al.* 2012), suggesting optimal conditions for producing economies of the populations of western and northwestern Pontic area. Evidence shows an increase in contacts between the eastern Balkans and the Ponto-Caspian steppe during 4500–4200 BC, coinciding with the intensification of the metal (copper) mining and production in the coastal Balkan region.

The formation of Ponto-Caspian Steppe (PCS) ancestry

At some point during the 5th millennium BC, a different kind of genetic ancestry entered the north Pontic and north Caspian steppes. It was derived from the Mesolithic populations of central Caucasus (Caucasus Hunter-Gatherer, CHG) (JONES *et al.* 2015) and Meso-Neolithic populations of north-northwestern Iran (LAZARIDIS *et al.* 2016). The EHG-CHG genetic admixture was documented in the communities of the Khvalynsk cultural complex of the middle Volga region (*Fig. 1.29*) and the Serednii Stih complex (the Oleksandriia site, *Fig. 1.1*) of the lower Don/Donets basin from the last two thirds of the 5th – early 4th millennium BC (MATHIESON *et al.* 2015; 2018; WANG *et al.* 2019). This merge between the EHG and

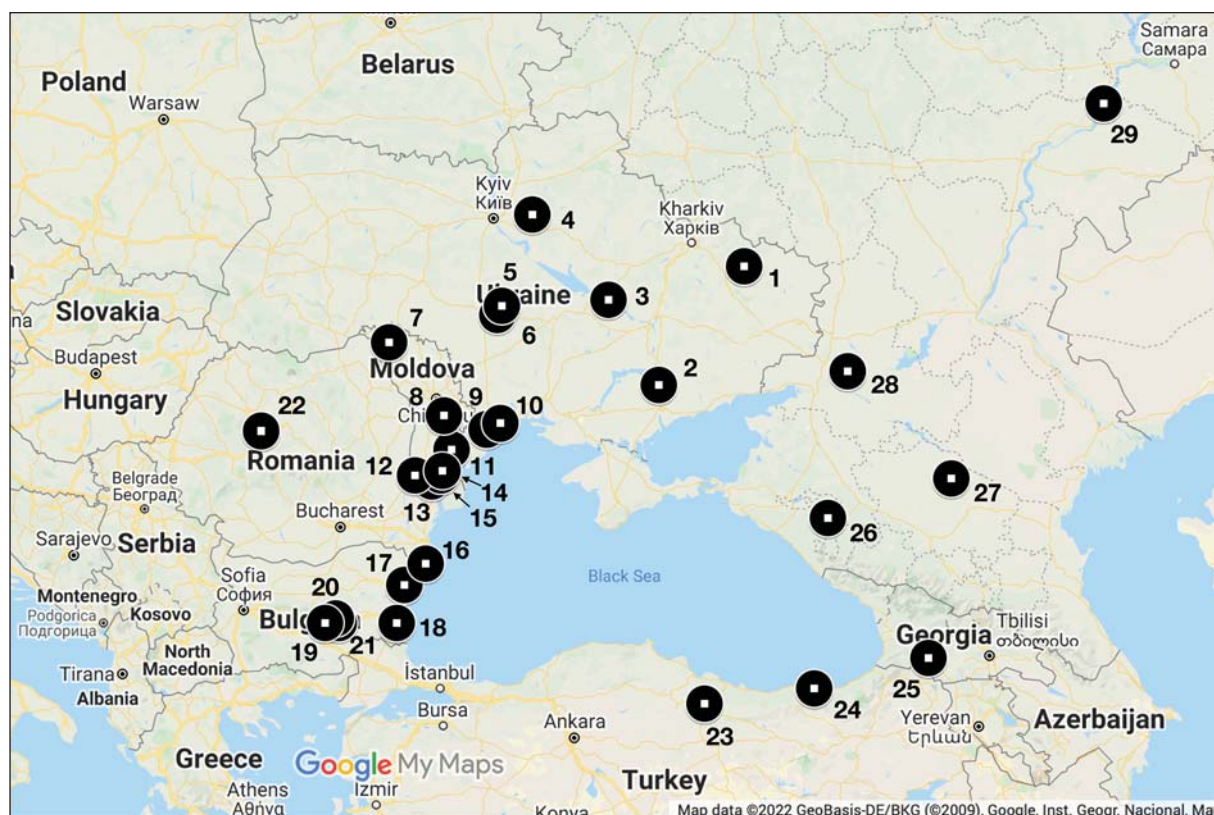


Fig. 1. Map of circum-Pontic sites mentioned in the text. The map is produced with Google Maps (maps.google.com). 1. Oleksandriia; 2. Mykhailivka; 3. Deriivka; 4. Sofiivka; 5. Maidanetske; 6. Nebelivka; 7. Chetrosica; 8. Căinari, Cărbuna; 9. Mayaky; 10. Usatove; 11. Sadove; 12. Giurgiulești; 13. Nova Nekrasivka; 14. Suvorove; 15. Utkonosivka; 16. Durankulak; 17. Varna; 18. Sozopol; 19. Ai-Bunar; 20. Karanovo; 21. Dyadovo; 22. Decea Mureșului; 23. Horoztepe; 24. Trabzon; 25. Kotias Klde; 26. Maykop; 27. Sharakhalsun; 28. Rakushechnyj Yar; 29. Khvalynsk

CHG ancestries became the foundation that would define the genetic core of the “steppe ancestry” that swept over Europe two millennia later.

Inhabitants of the Ponto-Caspian steppe maintained ties with agricultural communities to the west (the Balkans) and to the south (northern Caucasus) from as early as the 7th millennium BC. The influence of the Neolithic farming world on the communities of the Ponto-Caspian steppe region is evidenced through archaeology and archaeogenetics. Such as, remains of domesticated animals were identified in the early Neolithic layer at the Rakushechnyj Yar site in the lower Don (DOLBUNOVA *et al.* 2020) (Fig. 1.28). Comb-decorated pottery characteristic of the Impressed Ware culture appeared in the Lower Dnipro and northern Azov region in the early 6th millennium BC (KOTOVA – DEMCHENKO – KIOSAK 2021). Criș-influenced pottery at the Bug-Dniester culture sites in central Ukraine dates to around the same time (KIOSAK *et al.* 2021). At the genetic level, an early Eneolithic individual dated to 4949–4799 cal BC carrying a west European mtDNA haplogroup H1 and aligning with the Bulgarian Chalcolithic at the whole genome level was identified at the Neolithic Deriivka I cemetery (Fig. 1.3) on the lower Dnipro River (burial 102) (MATHIESON *et al.* 2018). Steppe-farmer interactions in the Eneolithic are evidenced by the presence of mitochondrial DNA (mtDNA) lineages of the H2a haplogroup of the Neolithic Anatolian origin (OMRAK *et al.* 2016) at the Khvalynsk II cemetery (grave 4) in Russia as well as at the Oleksandriia cemetery (grave 5) and the Vynogradne kurgan 3 (burial 15) in Ukraine (WILDE

et al. 2014; MATHIESON *et al.* 2015; 2018). The latter two individuals date to the end of the 5th– beginning of the 4th millennium BC (RASSAMAKIN 2009; MATHIESON *et al.* 2018).

It seems probable that while not adopting agriculture as primary subsistence strategy, the Neoeolithic inhabitants of the Ponto-Caspian steppe, such as those of the lower Don-middle Volga region, “borrowed” elements of farming economy, particularly domesticated animals (KOTOVA – MAKHORYKH 2010), from their farmer neighbors. A recent study determined that agro-pastoral practices at the Taman Peninsula, between the Black Sea and the Sea of Azov, started by 4995–4930 cal BC and likely have arrived to the Taman through the Caucasus-Caspian corridor (KANIEWSKI *et al.* 2016). Perhaps, this agro-pastoral introgression, likely through demic diffusion, brought elements of genetic ancestry from the Caucasus, such as CHG, resulting in the establishment of the “steppe” genetic mix (EHG+CHG) in the Ponto-Caspian area by the middle of the 5th millennium BC. By the end of the 4th millennium BC this steppe ancestry was passed to the people of the Yamna cultural complex. Steppe genetic ancestry will be referred to as Ponto-Caspian Steppe (PCS) ancestry throughout the paper from here on.

Eneolithic steppe pastoralists and the collapse of coastal Balkan communities

In the second half of the 5th millennium BC, steppe communities started to switch their subsistence to pastoralism. Pottery residue analysis from the Deriivka II site of the Serednii Stih II/Deriivka culture, dated to 4436–3988 BC (LILLIE *et al.* 2009), shows evidence of the early stages of pastoralist economy, which included domesticated ruminant ungulates and, to a lesser degree, their secondary products such as milk (MILETO *et al.* 2017). These herders came to dominate the Eneolithic steppe, reaching the farming frontier settlements in the forest-steppe zone of western and central Ukraine and eastern Moldova. They also started to make contacts with the salt-mining centers of eastern Balkans. These west Pontic communities amassed considerable wealth by the end of the first third of the 5th millennium BC, primarily due to the production of salt on an industrial scale. The proceeds of the salt exchange led to an investment into a new commodity – metal. It was copper at first, followed by gold, and this time period became known as the Copper Age, or Chalcolithic. In the early 4th millennium BC, arsenic bronze technology was developed in Anatolia and subsequently spread across west Pontic via traders from Anatolia and the Balkans (NIKOLOVA 2005). The extensive evidence of a long-range material goods exchange between the coastal communities of the west Pontic and the Eneolithic nomads of the Ponto-Caspian steppe has been thoroughly and extensively reviewed by D. Anthony (ANTHONY 2007; 2010; 2019).

At the same time, a sign of trouble can be seen throughout the communities of coastal Balkans in the second half of the 5th millennium BC. Radiocarbon dates from tell Karanovo indicate site abandonment by ca. 4400 cal BC (NIKOLOV – PETROVA 2016). In the late 5th millennium BC, mean annual precipitation dropped to the lowest point in 4000 years, to just under 750 mm (HARPER 2019). The only other time in the Black Sea coast prehistory between 6500 and 2500 cal BC the precipitation dropped to comparable lows was around 5700 cal BC (HARPER 2019), which coincided with the appearance of first LBK settlements in central Europe (NIKITIN *et al.* 2019). Such extreme aridization undoubtedly had an effect on human populations living along the west-northwest Pontic coast, and the farming economy overall. On the other hand, aridization led to the expansion of grazing lands for the Ponto-Caspian pastoralists to utilize. Aridization was also conducive to trade, particularly along the west-northwest shores of the Black Sea, where river crossings on the tributaries of the Danube started to dry up during predictable periods of the year, easing the travel across the northwestern Pontic region.

The aridization of the late 5th millennium BC was accompanied by a considerable climatic instability. This instability coincided with fluctuations in the Black Sea level. A significant cooling episode,

corresponding to the Bond 4 cooling event in the North Atlantic (BOND *et al.* 1997), also known as the 5.9 Kya event, followed. David Anthony analyzed climatic and archaeological literature around the Bond 4 event and concluded that 4200–3800 BC were characterized by intermittent cold years and a general degradation of arid soils in the Lower Danube area (ANTHONY 2007). At the end of the 5th millennium BC, a Black Sea transgression, caused by the factors yet unknown, resulted in a rapid inundation of a large portion of the west Black Sea littoral (PEEV *et al.* 2020). Pollen analysis of core samples from submerged settlements of Lake Varna and the Sozopol harbor (*Fig. 1.18*) indicate a cessation of agricultural activities at those sites by the end of the 5th millennium BC. The area remained submerged until the middle of the 4th millennium BC (FILIPOVA-MARINOVA – BOZILOVA 2008). The collapse of the Varna-Karanovo VI-Gumelnița (VKG) coastal west Pontic settlements during the last 300 years of the 5th millennium BC is likely directly connected with these atmospheric and hydrological events.

In all, farming activity in southeastern Europe experienced a marked decline by the end of the 5th millennium BC. This decline was accompanied by a rise of violence across the farming communities of Europe (NOVAK *et al.* 2021). With the reduction in the intensity of farming, population decline likely followed. Consequently, the demand on salt, the vital microelement of the farming communities, started to dwindle. The accompanying aridization might have further impeded the salt industry of the west Pontic that relied on salt springs, which might have dried up. Under these atmospheric circumstances, the lead in salt production shifted to the communities to the east (Usatove and, later, Yamna) that had access to salt that settles naturally (*Fig. 2*).



Fig. 2. Salt on the surface of the Kuyalnik Estuary (Liman) near the Usatove-Velykyj Kuyalnyk complex of the Usatove culture

Subsequently, salt-producing communities of Bulgaria began to lose their wealth and influence and eventually disappeared by the end of the 5th millennium BC. There are contrasting views on the events hastening the disappearance of these sites. Under one scenario, the tells of Chalcolithic east Balkan communities were ran down ca. 4400–4300 BC by the steppe horsemen in search of new grazing lands (GIMBUTAS 1977). However, archaeological evidence to support the violent end of the tells at the hands of the steppe invaders has been generally lacking (GOVEDARICA 2004), not to mention the lack of evidence of horse domestication in the 5th millennium BC. Under a contrasting viewpoint, intercommunal conflict that sparked as a result of the drought following the climate change after 4200 BC and the disappearance of the salt mining springs (NIKOLOV 2016) was the decisive factor in the demise of these communities.

It has been argued that a shift from sedentary to mobile pastoralist herding lifestyle took place in the late 5th – early 4th millennium BC in the Balkans (NIKOLOVA 2005). Apparently, various forms of economic specialization, possibly including autonomous pastoral communities, came to existence in different parts of the VKG complex at this time. A certain independence of pastoralism as a social and mythological subculture is found in the analysis of the linguistic foundations of the Balkan model of the world (PETRENKO 2009).

Usatove and its place in the circum-Pontic trade network

At the end of the 5th – beginning of the 4th millennium BC, farming was still actively practiced in the forest-steppe region of eastern Europe between the Carpathian Mountains and the Dnipro River by the people of the Cucuteni-Trypillia culture complex. Trypillian farmers likely obtained salt from a salt-producing center, associated with the people of the Usatove culture (*Fig. 3*), who settled around the brackish estuaries (limans) along the northwestern Black Sea shore in the Bugeac steppe (*Fig. 1.10*). The origins of Usatove may be connected with the VKG migration from the salt centers of east Bulgaria, following a surge in interpersonal violence and industrial decline of coastal Balkans. A dwelling in Nova Nekrasivka (*Fig. 1.13*) on the left bank of the lower Danube belonging to the Bolgrad-Aldeni II group, placed within the VKG complex and dated to 4350–4250 cal BC (KOTOVA 2013), was likely erected by the VKG refugees moving northeast. Nova Nekrasivka is located between Varna and Mayaky, an Usatove culture site (*Fig. 1.9*). A mid-5th millennium BC VKG site of Dyadovo, located near the eponymic Karanovo tell as well as the Thracian copper mining site of Ai-Bunar near Stara Zagora (*Fig. 1.19–21*), was reported to contain Usatove-like pottery (NIKOLOVA 2005), further strengthening the association between VKG and Usatove. An individual from a burial excavated outside of the ritual ditch enclosure at Mayaky (ZBENOVICH 1974) and dated to the third quarter of the 5th millennium BC, was found to genetically overlap with modern Bulgarian population (Emma Svensson, personal communication, 2017), while carrying mitochondrial haplogroup U4 (IVANOVA – NIKITIN – KIOSAK 2018). Haplogroup U4 is common among the Neo-Eneolithic inhabitants of the north Pontic steppe (IVANOVA – NIKITIN 2012; NIKITIN – NEWTON – POTEKHINA 2012; NIKITIN *et al.* 2017; MATHIESON *et al.* 2018). Thus, genetic evidence suggests that VKG migrants from coastal Bulgaria were interacting with local inhabitants of the Bugeac steppe by the end of the 5th millennium BC to form Usatove genetic ancestry. Radiocarbon dates using AMS technology obtained on two burials from the Mayaky necropolis (PETRENKO – GERLING – KAISER 2018) and the finding of Trypillia A-BI ceramics at the same site (PETRENKO 2009), corroborate the presence of an ancestral to Usatove population at the Mayaky site at the end of the 5th millennium BC.

Usatove occupied a strategic crossroads in the circum-Pontic trade network. In fact, Usatove's trade network might have extended into the Mediterranean zone. An Usatove kurgan near the village of Sadove on the western bank of the Dniester Estuary (*Fig. 1.11*) produced finds of beads of white faience,

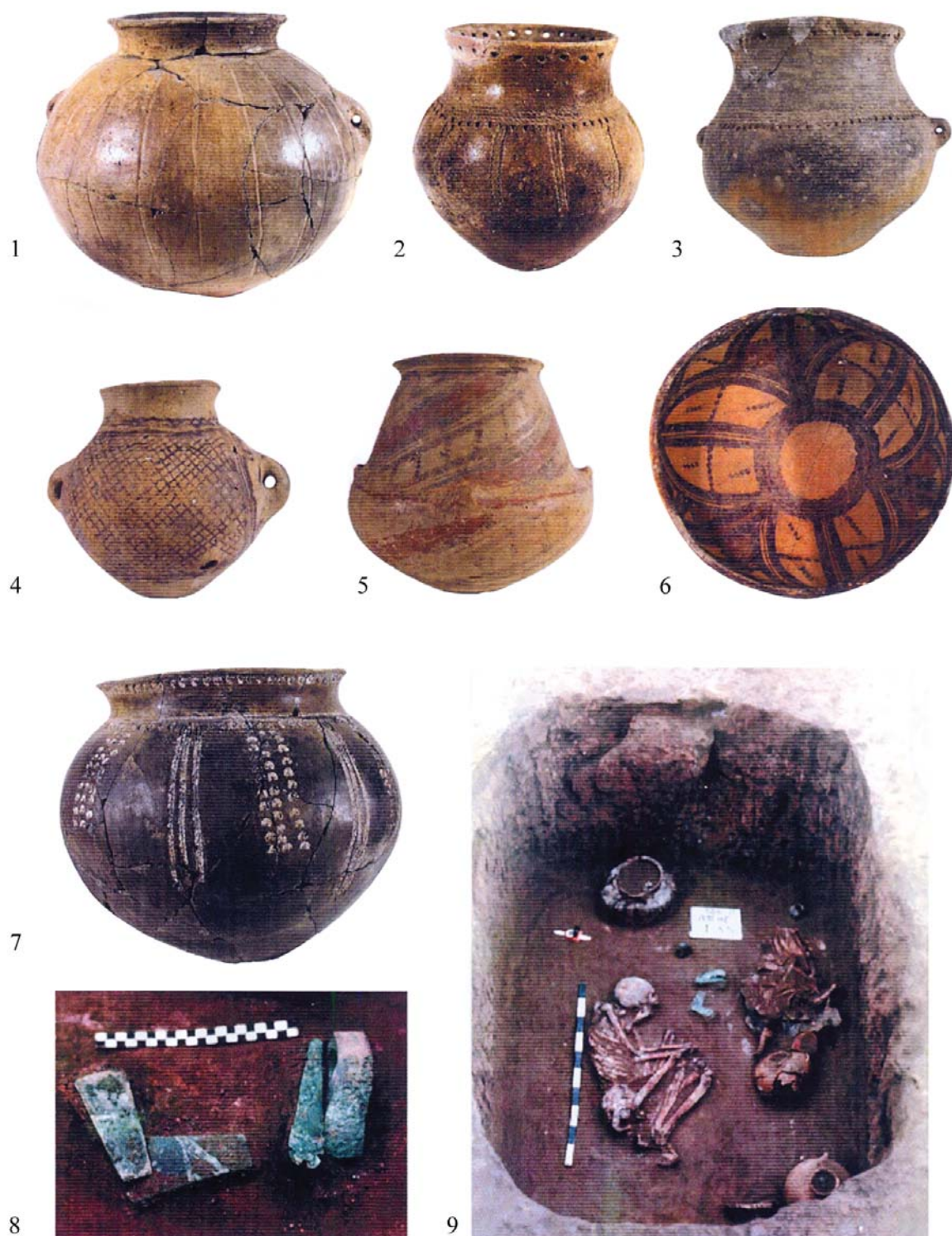


Fig. 3. Usatove culture artifacts. 1–3, 7. polished ceramics; 4–6. painted vessels; 8. copper and bronze artifacts (two flat axes/adzes, knife, chisel). Location of finds: 1, 2, 4–6. Mayaky; 3. Usatove; 7–9. main burial No. 35 of the Oleksandrivskyi kurgan (after IVANOVA – NIKITIN – KIOSAK 2017, Fig. 40)

jet, Mediterranean horn corals (gorgonians) and a pendant-amulet from a typical Egyptian “alabaster” (PETRUN’ 2000). Glass beads found in the second kurgan of the archaeological complex Usatove-Velykyj Kuyalnyk are among the oldest glass objects known in the Old World. Glass beads of comparable antiquity have been found at the Trypillian cemetery of Sofiivka near Kyiv (*Fig. 1.4*) (KLOCHKO – STOLPIAK 1995) and in a Trypillian treasure hoard near the village of Chetroșica in Moldova (*Fig. 1.7*), in the Middle Dniester region (SERGEYEV 1969). The Usatove-Velykyj Kuyalnyk glass beads were likely made locally – as a product accompanying bronze metallurgy, indicated by the presence of arsenic in the glass (KLOCHKO – STOLPIAK 1995). Eneolithic glass from the Pontic area belongs, according to A. Ostroverkhov, to the circum-Pontic “proto-school” of glass making with roots in Anatolia and South Transcaucasia (OSTROVERKHOV 2002). High arsenic bronze technology existed in Anatolia since the early 4th millennium BC (YENER 2000). Fragments of some of the Usatove stone axes were made of mudstone-like rocks and porphyry-like microdiorite, the deposits of which are located beyond the Danube (PATOKOVA *et al.* 1989). The liquation coating technology of covering the casting mold matrix with carbon, which gives the surface of large “Anatolian” daggers from the Usatove-Velykyj Kuyalnyk complex a silver-like shine, was used by Maykop metalsmiths and likely originated there (*Fig. 1.26*). Another coating technology, obtained by rubbing the finished bronze product with a paste containing a mixture of arsenic oxides, plant ash and charcoal followed by heating, was recorded on a dagger from the Usatove culture, found in kurgan 5 near the village of Utkonosivka (*Fig. 1.15*), as well as on some Maykop daggers and on ritual figurines of bronze bulls from Horoztepe in Anatolia (*Fig. 1.23*) (RYNDINA 2002). High arsenic bronze finds from Usatove are technologically similar to the bronze from Ilipinar in northwest Anatolia (NIKOLOVA 2005). Silver objects found at Usatove sites could have originated from the Aegean (Lavriion and Sifnos) or Maykop (Caucasus) mines (JOVANOVIČ 1993; PETRENKO 1997).

In all probability, Usatove was in direct contact with the Pontic steppe couriers of the Serednii Stih complex who brokered the exchange between the Volga-Caspian communities and the metal centers of Varna-Karanovo VI. On the other hand, Usatovans closely interacted with the Suvorove-Giurgiulești groups that established trade posts at river crossings along the trade routes in the lower stretches of major rivers of the northwestern Black Sea basin such as the Dniester and the Danube.

Eneolithic steppe nomads: traders or raiders?

The shell-tempered (Cucuteni type C) pottery characteristic of Khvalynsk-Serednii Stih began to appear on VKG/Kodjadermen sites towards the end of phase III/A-2, corresponding to Trypillia BI, ca. 4300–4100 cal BC (GEORGIEVA 2018). Ceramic vessels of the Serednii Stih II/Deriivka type have been found on the Bolgrad-Aldeni II sites (KOTOVA 2013). The continuous occultation record at many of the VKG/Kodjadermen tells, despite intermittent layers indicative of burning/site destruction, argue for a peaceful (at least initially) coexistence between the local tell occupants and the incoming steppe traders (GEORGIEVA 2018).

The analysis of copper from the Khvalynsk I and II necropoli as well as copper from Novonanylivka sites indicates that it is predominantly of the Balkan origin (CHERNYKH 1992; 2010; GEORGIEVA 2018). The boar-tusk pendant found in burial 3 of the Giurgiulești necropolis bears similarity in shape and design to the gold pendant from the Varna necropolis (*Fig. 1.12*) (GEORGIEVA 2018). It is noteworthy that copper from an early Trypillian Cărbuna hoard from Moldova (4700–4600 BC) was made from Bulgarian material that was likely recycled and traded throughout the steppe, including the Volga Valley (RADIVOJEVIĆ – ROBERTS 2021 and references therein).

At the same time, whether the west Pontic copper and other material goods arrived in the steppe through trade or conquest, is difficult to ascertain. Both scenarios have support. The weaponized burial inventory of Suvorove (*Fig. 1.14*) and Novodanylivka, Suvorove's counterpart from the east Pontic, point to the militarized nature of their societies. At the same time, the weapons and status objects buried with them may have been intended to exert control over the trade routes. The trade route control vs. raiding scenarios, however, are not mutually exclusive. It is conceivable that Suvorove-Novodanylivka brought Balkan copper ingots (not ore, but billets, which are often found in Trypillian context) to Trypillian communities. There, metalsmiths riveted beads / hairpins, etc. patterned after Bulgarian craftsmen (or craftswomen) who fled to their Trypillian relatives after the demise of their settlements in the late 5th millennium BC. Perhaps the Trypillian megasites of the Nebelivka type are precisely connected with this migration. Under a scenario, preferred by one of the authors (AGN), the Nebelivka site (*Fig. 1.6*) (as well as other BII Trypillian megasites) served, in addition to other functions, as temporary shelters for migrants from the Balkans. Nebelivka existed for only 200 years, 3950–3750 cal BC, and had 1,445 buildings detected to date, which, apparently, were not occupied on a permanent basis (ALBERT *et al.* 2020). While the refugee function of Trypillian megasites remains tentative, a graphite-painted vessel, most likely imported from a Gumelnița group, was found at Nebelivka (GAYDARSKA – NEBBIA – CHAPMAN 2020). This find suggests a connection between terminal Gumelnița and the beginning of mega-construction at Nebelivka ca. 4000 cal BC. A gold spiral ornament found at Nebelivka could be traced to east Bulgaria as well (GAYDARSKA 2020), further strengthening the ties between Nebelivka and Gumelnița-Karanovo. The arrangement of the massive 345m² megastructure at the main entrance to another Trypillian megasite at Maidanetske (*Fig. 1.5*), suggests this building could have served, among other functions, as a welcoming center for refugees. Evidence of evenly distributed food consumption activities throughout the structure (HOFMANN *et al.* 2019) corroborates this interpretation of the building's function. At the same time, the disbalance between the energy input to construct and maintain Nebelivka and other megasites and their use as temporary refugee camps does become apparent. We should point out, however, that no comprehensive explanation for the existence of Trypillian megasites has been put forward to date.

Recent studies of the “steppe graves” of the Suvorove type, located between the Danube and the Dniester indicate that these can be collectively dated to the second half of the 5th millennium BC, coinciding with the abandonment of the Balkan tells. A Suvorove-type site of Căinari produced a date of 4504–4339 cal BC (*Fig. 1.8*) (GOVEDARICA 2004). Two dates from the ground necropolis of the Suvorove type at Decea Mureșului in Transylvania date it to the last third of the 5th millennium BC (*Fig. 1.22*) (GOVEDARICA 2004; ROTEA *et al.* 2014). The Eneolithic necropolis under kurgan 2 at the Suvorove site of Giurgiulești was dated to 4447–4069 cal BC (GOVEDARICA – MANZURA 2016). Yet, the overlapping chronology of the Suvorove-type graves and the abandonment of the Balkan tells do not necessarily indicate that the latter is the consequence of the violent activity of the former. Still, a connection between Suvorove and VKG undoubtedly existed. A Gumelnița pot in one of the sacrificial pits at Giurgiulești (PETRENKO 2009) is yet another piece of the already discussed evidence supporting this connection.

The establishment of PCS ancestry in the circum-Pontic trade network

We are beginning to get genetic data from the Eneolithic populations of the west-northwest Pontic area as well. Insufficient preservation of DNA coupled with handling and storage issues of the excavated material, as well as the accessibility of the material for genetic analysis, make the genetic ancestries

of steppe populations difficult to ascertain. At the same time, significant progress in finding out the details of their ancestry is currently being made. Maternal genetic (mtDNA) lineages identified at the Suvorove-type site at Decea Mureșului belonged to the K haplogroup (ROTEA *et al.* 2014), one of the major mtDNA haplogroups of Anatolian Neolithic farmers and their European agrarian descendants (NIKITIN 2019). Preliminary results of the genetic analysis of the interred at Giurgiulești, obtained in the lab of David Reich at Harvard (D. Reich, personal communication, 2021), indicate that the uniparental genetic lineages from a child in burial 3 match those of a Mesolithic hunter-gatherer (JONES *et al.* 2015) from the Kotias Klde rock shelter site in the Republic of Georgia (*Fig. 1.25*). The Kotias site lies approximately 100 km away from the eastern Black Sea shore in southwest Caucasus. The Kotias genetic ancestry is characterized by the CHG component, which also characterizes PCS ancestry along with the EHG genetic component. Published evidence indicates the presence of varying amounts of PCS ancestry in the Balkans (Smyadovo, Tell Yunatsite, Varna) ca. 4700–4400 BC (MATHIESON *et al.* 2018). On the other side of the Ponto-Caspian steppe range, PCS ancestry was present in the Samara region at Khvalynsk, in a chronologically earliest, to date, burial 12, dated to 4934–4780 cal BC (WANG *et al.* 2019). After incorporating the offset produced by freshwater reservoir effect (FRE), the upper range for the appearance of the PCS ancestry at Khvalynsk should be considered to be about 4700 BC (D. Anthony, personal communication, 2019), or coeval with its appearance on the western shores of the Black Sea. We can thus conclude that PCS ancestry may have already been present throughout the circum-Pontic trade network by about 4700 BC and that it became established among the participants of that network by the end of the 5th millennium BC.

The routes and transports of the circum-Pontic trade network

The routes of the Circum-Pontic trade network can be traced through burials and settlements with non-local features, as well as artifacts that may have resulted from direct or multi-stage exchange. The Kotias site is about 400 km northeast from Trabzon in northeastern Anatolia by land and ca. 300 km by sea. Artifacts found at the Giurgiulești necropolis bear resemblance with the items from the “Trabzon hoard” which (*Fig. 1.24*), in turn, are remarkably similar to the finds from the Eneolithic necropoli at Varna and Durankulak (*Fig. 1.16–17*) (IVANOVA 2012). All these sites might have been connected by the Eneolithic intercontinental trade network that involved the entire Black Sea shore and extending to the north Caspian shore, from where trade goods would have been delivered following the Volga River to Khvalynsk. While it is possible to carry the activities associated with this trade following overland routes, it might have been more efficient to travel by sea.

The Varna estuary can be considered the starting point of the Eneolithic maritime trade. From Varna, trade goods such as copper would have been transported to the Danube delta by boats sailing along the coast. From there, trade commodities would have been carried inland following the Prut, Siret, Bug, and Dniester rivers (TODOROVA – VAISOV 1993). It is possible that the Eneolithic cultures of the Balkan-Danube region extended the sea trade routes along the northern Pontic shore and via the waterways of the Kuma-Manych depression to the Volga and upriver to Khvalynsk (POPOV – DIMOV 2019).

If the Eneolithic circum-Pontic trade was carried out overland, the question about the transport used for this activity needs to be addressed. While metal ingots and finished metal products can be carried by individual couriers, metal ore and salt would require means of transportation capable of moving heavy payloads. Wheeled wagons ideally fit such transportation need. Clay models of disc wheels begin to appear on Trypillian settlements in the middle 4th millennium BC (KORVYN-PYOTROVSKYY – MOVSHA 1999). Some scholars connect the distribution of Trypillian imports in the steppe during the second half of

the 4th millennium BC with the activity of the Zhivotilovka-Volchansk steppe groups (RASSAMAKIN 1996; 1999). Burials from the eastern Azov steppe (Koldyri kurgan 14 burial 7 and Novokorsunskaya kurgan 2 burial 18), which are attributed by some scholars to Zhivotilovka-Volchansk (RASSAMAKIN 1996), or to Novosvobodnaya-Maykop, by others (KONDRASHOV – REZEPKIN 1988; IZBITSER 1993; 2017), had wooden wheels in the graves. Both burials are dated to before the last third of the 4th millennium BC (IZBITSER 2017). The famous sitting in a wagon Sharakhalsun 2 burial 18, dated to 3336–3105 cal BC (WANG *et al.* 2019), is located in the Manych steppe, ~500 km to the east (Fig. 1.27). An investigation into the genetic connection between the Manych and Zhivotilovka-Volchansk wagon drivers is currently taking place at the lab of D. Reich at Harvard.

It has been suggested that the origin of the Novosvobodnaya cultural group is associated with the influence or direct migration of the Funnel Beaker culture (FBC) groups from Central Europe (REZEPKIN 1989; 1991). A FBC pot from Bronocice, Poland, dated to 3637–3373 cal BC (MILISAUSKAS – KRUK – HUDSON 2019), carries one of the earliest known depictions of a wheeled wagon in Europe. Whether the Koldyri and Novokorsunskaya wheels (and, we should assume, wagons) and the Sharakhalsun 2/18 wagon are related to, or, perhaps, descend from, the FBC wagons of central Europe, remains an open question. Meanwhile, archaeological evidence strongly supports the presence of wheeled transport in the Ponto-Caspian steppe by 3500–3300 BC, facilitating long-range mobility in the steppe during the second half of the 4th millennium BC.

The Eneolithic steppe corridor and the origin of Yamna

Despite the apparent diversity of culture types, Eneolithic steppe populations of the Ponto-Caspian region were, to a large extent, interconnected through genetics, ritual attributes, and economy. The main players on the Eneolithic steppe scene were the Serednii Stih and Khvalynsk complexes. Serednii Stih formed in the Don-Kalmius interfluvium near simultaneously with the Khvalynsk forming in the Volga region, in the late 6th – early 5th millennium BC (not FRE-adjusted). The similarity in material culture and burial customs led some scholars to propose the existence of the Khvalynsk-Serednii Stih cultural-historical complex (KOTOVA 2008). Serednii Stih bordered Khvalynsk along the Don-Volga boundary through the first two thirds of the 5th millennium BC (KOTOVA 2008). In the last third of the 5th millennium BC, a distinct Deriivka culture formed within the Serednii Stih horizon (KOTOVA 2013). The culture was named after a pastoralist settlement of Deriivka II that appeared next door to the fishers of Deriivka I (TELEGIN 1986).

Deriivka I continued local Neolithic traditions well into the 4th millennium BC. Genetically, however, they started to harbor PCS admixture since the middle of 4th millennium BC (MATHIESON *et al.* 2018), likely brought by the Serednii Stih II/Deriivka pastoralists. Steppe genetic ancestry was present in Khvalynsk since the first third of the 5th millennium BC (WANG *et al.* 2019). It is just a matter of time before the early Serednii Stih is shown to harbor PCS ancestry as well.

Integration between the different steppe groups of the 4th millennium BC led to shared cultural attributes. The common cultural package was forged by the reciprocal absorbing of the influences of the neighboring groups, as well as the traditions of the more distant communities they interacted with. Such as, from the Mariupol-type extended supine burial position of the Dnipro Valley fishers and the crouched on the side position of the farming groups of Anatolia, Europe and the Caucasus, a “rider” position with the body on the back and the legs bent at the knees, eventually evolved. This burial position became dominant in the Yamna horizon. The kurgan-building ritual favored by the Yamna may have come from the contact zone between Trypillians and FBC communities (NIKITIN *et al.* 2017). Archaeological and

genetic evidence suggests the influence of Serednii Stih pottery styles on Trypillian ceramics and the presence of Serednii Stih on Trypillian sites in central Ukraine from the beginning of the 4th millennium BC (NIKITIN *et al.* 2023). Thus, the Anatolian/Levantine farmer genetic component that defines the Yamna ancestry along with EHG and CHG (WANG *et al.* 2019) could have come from Trypillia-FBC as well.

Interactions with the Caucasus during the Eneolithic undoubtedly influenced the ethno-cultural landscape of the North Pontic steppe as well, potentially contributing to the establishment of the Yamna phenomenon. Radiocarbon dates from Lower Mykhailivka, a Serednii Stih II/Deriivka culture group, overlap with the dates from Maykop culture sites (KOTOVA 2013). Maykop pottery was found in the Lower Mykhailivka archaeological context (KOROBKOVA – SHAPOSHNIKOVA 2005). The relationship between the Pontic steppe communities and north Caucasus may, in fact, predate Maykop. This is evidenced by the finds of the Serednii Stih I/Skelya ceramics in the pre-Maykop phase of the Svobodnoe settlement (PETRENKO 2009). Trade/exchange links between the Caucasus and western Pontic were maintained in the 4th millennium BC by the Maykop-Novosvobodnaya – Cernavodă – Usatove interactions (ANTHONY 2007), with Lower Mykhailivka a likely intermediary. The Caucasus influence during the Maykop period extended throughout the Pontic region and reached as far west as northwest Moldova (DERGACHEV 2019). These interactions likely influenced the cultural transformation leading up to Yamna, although it is unclear to what extent this influence had extended.

The archaeological sequence of the multi-layer Mykhailivka settlement (*Fig. 1.2*) from the Eneolithic Lower Mykhailivka to Yamna (KOROBKOVA – SHAPOSHNIKOVA 2005), strongly suggests the participation of Lower Mykhailivka in the formation of Yamna. Ceramic assemblage of Lower Mykhailivka links it with Trypillia (KOROBKOVA – SHAPOSHNIKOVA 2005), the genetic ancestry of which is predominantly of Anatolian farming origin (MATHIESON *et al.* 2018). On the other hand, the influx of farming genetic ancestry in the Eneolithic steppe could have resulted from interactions between Deriivka II and Gumelnița, which, according to N. Kotova, participated in the formation of the Lower Mykhailivka group (KOTOVA 2013). It is also possible that the contacts between Lower Mykhailivka and the north Caucasus led to the influx of farming genetic ancestry, associated with the Anatolian/Levantine farmers of the Neolithic, into the steppe gene pool. At the same time, genetic evidence published to date argues against the Anatolian farmer genetic component in the Yamna to be derived from the Caucasus (WANG *et al.* 2019).

Considering the existence of early Yamna burials at Usatove sites (PETRENKO – GERLING – KAISER 2018), Usatove may have participated in the formation of the Yamna ancestry as well. Thus, Anatolian farming ancestry detected in Yamna may have come from Usatove, which received this ancestry from VKG. Eneolithic farming groups stemming from VKG are the likely genetic founders of Trypillia (NIKITIN 2020). Taken together, VKG-Trypillia emerges as the primary candidate for the source of the Anatolian farming genetic ancestry in the Yamna.

Conclusion

We propose that a circum-Pontic trade network was established by the end of the first third of the 5th millennium BC, linking the salt and metal-producing centers of west Pontic with the Eneolithic nomadic groups of the Ponto-Caspian steppe. This network extended from the western shores of the Black Sea throughout the steppe and the adjacent forest-steppe area from the Carpathian foothills in the west to the middle Volga/Samara region in the east. This network also involved coastal communities along the eastern-southeastern Black Sea and the adjacent inland areas. Trade goods, along with genes and

novel technological advances, were exchanged along this trade area, giving rise to long-range mobility. Cultural innovations and their subsequent exchanges among the steppe groups bound by shared ancestry contributed to the formation of common ideology throughout the steppe portion of the network, thus setting the stage for a large-scale transformation to the Yamna worldview. The proximate factors that precipitated the switch to the Yamna tradition remain elusive.

These trade exchanges also promoted the establishment of the PCS ancestry during the second half of the 5th millennium BC, through interactions between the steppe inhabitants and their partners in the trade of copper and other material goods. This genetic ancestry, combining EHG, CHG and, to varying extent, Neolithic Anatolian/Levantine farmer components, became the genetic signature of the Yamna people in the EBA and which spread throughout Europe by the middle of the 3rd millennium BC. It is also conceivable that the Indo-European language group was formed within this circum-Pontic trade network, and involved linguistic elements of the participant groups and cultures of Anatolia, eastern Balkans, the Ponto-Caspian steppe and adjacent forest steppe, and the Caucasus.

Acknowledgements

The authors would like to express their gratitude to Nadezhda Kotova, David Anthony, Victor Klochko, Yuri Rassamakin, David Reich, and Mykhailo Videiko for fruitful discussions as well as for sharing their thoughts and unpublished data.

References

- ALBERT, B. – INNES, J. – KREMENTSKIY, K. – MILLARD, A. R. – GAYDARSKA, B. – NEBBIA, M. et al. 2020
What was the ecological impact of a Trypillia megasite occupation? Multi-proxy palaeo-environmental investigations at Nebelivka, Ukraine. *Vegetation History and Archaeobotany* 29/1 (2020) 15–34. doi: 10.1007/s00334-019-00730-9.
- ANDERSON, D. E. – GOUDIE, A. S. – PARKER, A. G. 2007
Global Environments Through the Quaternary: Exploring Environmental Change. Oxford: Oxford University Press 2007.
- ANTHONY, D. W. 2007
The Horse, the Wheel, and Language: How Bronze Age riders from the Eurasian Steppes shaped the modern world. Princeton 2007.
- ANTHONY, D. W. 2010
The Lost World of Old Europe. The Danube Valley, 5000–3500 BC. Princeton and Oxford: Princeton University Press 2010.
- ANTHONY, D. W. 2019
Archaeology, genetics, and language in the steppes: a comment on Bomhard. *The Journal of Indo-European Studies* 47/1–2 (2019) 175–198.
- BOND, G. – SHOWERS, W. – CHESEBY, M. – LOTTI, R. – ALMASI, P. – DEMENOCAL, P. et al. 1997
A pervasive millennial-scale cycle in North Atlantic Holocene and glacial climates. *Science* 278/5341 (1997) 1257–1266. doi: 10.1126/science.278.5341.1257.

CAROZZA, J.-M. – MICU, C. – MIHAIL, F. – CAROZZA, L. 2012

Landscape change and archaeological settlements in the lower Danube valley and delta from early Neolithic to Chalcolithic time: A review. *Quaternary International* 261 (2012) 21–31. doi: 10.1016/j.quaint.2010.07.017.

CHERNYKH, E. N. 1992

Ancient Metallurgy in the USSR: The Early Metal Age. New studies in archaeology. New York 1992.

CHERNYKH, Y. N. 2010

Med' iz khvalynskikh mogil'nikov i yeye paralleli (po dannym spektroanaliticheskikh issledovaniy). In: Agapov, S. A. (ed): *Khvalynskiye Eneoliticheskiye Mogil'niki i Khvalynskaya Eneoliticheskaya Kul'tura. Issledovaniya Materialov*. Samara: Ofort-Press 2010, 219–233.

DERGACHEV, V. A. 2019

Maykop in the late Tripolye culture. In: Polyakov, A. V. – Tkach, E. S. (eds.): *Antiquities of East Europe, South Asia and South Siberia in the context of connections and interactions within the Eurasian cultural space (new data and concepts). Volume II. Connections, contacts and interactions between ancient cultures of northern Eura*. St. Petersburg: IIMK RAN, Nevskaya Tipographia 2019, 128–131.

DOLBUNOVA, E. V. – TSYBRYI, V. V. – MAZURKEVICH, A. N. – TSYBRYI, A. V. – SZMAŃDA, J. – KITTEL, P. et al. 2020

Subsistence strategies and the origin of early Neolithic community in the lower Don River valley (Rakushechny Yar site, early/middle 6th millennium cal BC): First results. *Quaternary International* 541 (2020) 115–129. doi: 10.1016/j.quaint.2019.05.012.

FILIPOVA-MARINOVA, M. – BOZILOVA, E. 2008

Palynological data of submerged prehistoric settlements along the Bulgarian Black Sea coast. In: Slavchev, V. (eds.): *The Varna Eneolithic Necropolis and Problems of Pre-History in Southeast Europe*. Varna: Regional Historical Museum 2008, 209–220.

GAYDARSKA, B. (Ed.) 2020

Early Urbanism in Europe. The Trypillia Megasites of the Ukrainian Forest-Steppe. De Gruyter Poland Ltd, Warsaw/Berlin 2020. <https://doi.org/10.1515/9783110664959>

GAYDARSKA, B. – NEBBIA, M. – CHAPMAN, J. 2020

Trypillia Megasites in Context: Independent Urban Development in Chalcolithic Eastern Europe. *Cambridge Archaeological Journal* 30/1 (2020) 97–121. doi: 10.1017/S0959774319000301.

GEORGIEVA, P. 2018

Possible approaches to tracing the fate of the population of the Varna, Kodjadermen-Gumelnița-Karanovo VI and Krivodol-Sălcuța cultures. In: Dietz, S. – Mavridis, F. – Tankosić, Ž. – Takaoğlu, T. (eds.): *Communities in Transition: The Circum-Aegean Area during the 5th and 4th Millennia BC*. Oxford 2018, 95–106.

GIMBUTAS, M. 1977

The first wave of Eurasian steppe pastoralists into Copper Age Europe. *Journal of Indo-European Studies* 5/4 (1977) 277–338.

GOVEDARICA, B. 2004

Zepterträger-Herrscher der steppen. Die frühen Ockergräber des älteren Äneolithikums im karpatenbalkanischen Gebiet und im Steppenraum Südost-und Osteuropas. Balkankommission der Heidelberger Akademie der Wissenschaften 6. Mainz am Rhein 2004.

GOVEDARICA, B. – MANZURA, I. 2016

The Giurgiulești cemetery in chronological and cultural context of Southeastern and Eastern Europe. *Eurasia Antiqua* 22 (2016) 1–39.

HAAK, W. – LAZARIDIS, I. – PATTERSON, N. – ROHLAND, N. – MALLICK, S. – LLAMAS, B. et al. 2015

Massive migration from the steppe was a source for Indo-European languages in Europe. *Nature* 522 (2015) 207–211.

HARPER, T. K. 2019

Demography and climate in Late Eneolithic Ukraine, Moldova, and Romania: Multiproxy evidence and pollen-based regional corroboration. *Journal of Archaeological Science: Reports* 23 (2019) 973–982. doi: 10.1016/j.jasrep.2017.06.010.

HOFMANN, R. – MÜLLER, J. – SHATILO, L. – VIDEIKO, M. – OHLRAU, R. – RUD, V. et al. 2019

Governing Tripolye: Integrative architecture in Tripolye settlements. *PLOS ONE* 14/9 (2019) p.e0222243.

IVANOVA, M. 2012

Perilous waters: Early maritime trade along the western coast of the Black Sea (Fifth Millennium BC). *Oxford Journal of Archaeology* 31/4 (2012) 339–365.

IVANOVA, S. – NIKITIN, A. G. 2012

Population dynamics of the steppe cultures of the Eneolithic and Early Bronze Age from the point of view of archaeogenetics. *Stratum Plus* 2 (2012) 1–11.

IVANOVA, S. – NIKITIN, A. G. – KIOSAK, D. 2017

Steppe population in Central Europe of the Early Bronze Age, Or a Journey There and Back. Part II/ Stepnoe naselenie v Tsentralnoy Evrope epokhi ranney bronzy, ili puteshestvie tuda i obratno. http://генофонд.рф/?page_id=27671 (accessed on 18.04.2023).

IVANOVA, S. – NIKITIN, A. G. – KIOSAK, D. 2018

Pendulum migrations in the Circum-Pontic steppe and Central Europe during the Paleometal Epoch and the problem of genesis of the Yamna culture. *Archeologia* 26/1 (2018) 101–146.

IZBITSER, E. 1993

Wheeled vehicle burials of the steppe zone of Eastern Europe and Northern Caucasus, 3rd-2nd millennium B. C. Institute of the History of Material Culture, St. Petersburg 1993.

IZBITSER, E. 2017

Novokorsunskaya 2/18, a grave with a wagon: Work on mistakes. *Tyragetia* 11[26]/1 (2017) 83–85.

JONES, E. R. – GONZALEZ-FORTES, G. – CONNELL, S. – SISK, V. – ERIKSSON, A. – MARTINIANO, R. et al. 2015

Upper Palaeolithic genomes reveal deep roots of modern Eurasians. *Nature Communications* 6 (2015) 8912.

JOVANOVIČ, B. 1993

Silver in the Yamna (Pit-Grave) Culture in the Balkans. *The Journal of Indo-European Studies* 21/3–4 (1993) 207–214.

KANIEWSKI, D. – GIAIME, M. – MARRINER, N. – MORHANGE, C. – BOLIKHOVSKAYA, N. S. – POROTOV, A. V. et al. 2016

Emergence of agriculture on the Taman Peninsula, Russia. *Méditerranée* 126 (2016) 111–118. doi: 10.4000/mediterranee.8300.

- KIOSAK, D. – KOTOVA, N. – TINNER, W. – SZIDAT, S. – NIELSEN, E. H. – BRUGGER, S. O. et al. 2021
The last hunter-gatherers and early farmers of the Middle Southern Buh River Valley (Central Ukraine) in VIII-V mill. BC. *Radiocarbon* 63/1 (2021) 121–137. doi: 10.1017/RDC.2020.120.
- KLOCHKO, V. I. – STOLPIAK, B. 1995
Glass beads from Sofievka cemetery. *Baltic-Pontic Studies* 3 (1995) 243–246.
- KONDRASHOV, A. V. – REZEPKIN, A. D. 1988
Novosvobodnenskoye pogrebeniye s povozkoy. *KSIA* 193 (1988) 91–97.
- KOROBKOVA, G. F. – SHAPOSHNIKOVA, O. G. 2005
Mikhailovka: Etalonni Pamiatnik Drevnei Yamnoi Kul'tury. St. Petersburg 2005.
- KORVYN-PYOTROVSKYY, O. H. – MOVSHA, T. H. 1999
Kolisnyy transport trypil's'ko-kukutens'koyi spil'nosti'. *Kul'turolohichni studiyi* 2 (1999) 70–78.
- KOTOVA, N. S. 2008
Early Eneolithic in the Pontic steppes. BAR Intern. Oxford, UK: British Archaeological Reports 2008.
- KOTOVA, N. S. 2013
Dereivskaya kul'tura i pamyatniki Nizhnemikhaylovskogo tipa. Kiev, Kharkov: Maidan 2013.
- KOTOVA, N. – MAKHORTYKH, S. 2010
Human adaptation to past climate changes in the northern Pontic steppe. *Quaternary International* 220/1–2 (2010) 88–94. doi: 10.1016/j.quaint.2009.09.026.
- KOTOVA, N. – DEMCHENKO, O. – KIOSAK, D. 2021
Innovations of the Beginning of the Sixth Millennium BC in the Northern Pontic Steppe. *Open Archaeology* 7/1 (2021) 1529–1549. doi: 10.1515/opar-2020-0185.
- LAZARIDIS, I. – NADEL, D. – ROLLEFSON, G. – MERRET, D. C. – ROHLAND, N. – MALLICK, S. 2016
Genomic insights into the origin of farming in the ancient Near East. *Nature* 536 (2016) 419–424. doi: 10.1038/nature19310.
- LILLIE, M. – BUDD, C. – POTEKHINA, I. – HEDGES, R. 2009
The radiocarbon reservoir effect: new evidence from the cemeteries of the middle and lower Dnieper basin, Ukraine. *Journal of Archaeological Science* 36/2 (2009) 256–264. doi: 10.1016/j.jas.2008.09.005.
- MALMSTRÖM, H. – GILBERT, M. T. P. – THOMAS, M. G. – BRANDSTRÖM, M. – STORÅ, J. – MOLNAR, P. 2009
Ancient DNA Reveals Lack of Continuity between Neolithic Hunter-Gatherers and Contemporary Scandinavians. *Current Biology* 19/20 (2009) 1758–1762. doi: 10.1016/j.cub.2009.09.017.
- MATHIESON, I. – LAZARIDIS, I. – ROHLAND, N. – MALLICK, S. – PATTERSON, N. – ALPASLAN ROODENBERG, S. et al. 2015
Genome-wide patterns of selection in 230 ancient Eurasians. *Nature* 528 (2015) 499–503.
- MATHIESON, I. – ALPASLAN-ROODENBERG, S. – POSTH, C. – SZÉCSÉNYI-NAGY, A. – ROHLAND, N. – MALLICK, S. et al. 2018
The genomic history of southeastern Europe. *Nature* 555/7695 (2018) 193–203.

- MILETO, S. – KAISER, E. – RASSAMAKIN, Y. – EVERSHED, R. P. 2017
New insights into the subsistence economy of the Eneolithic Dereivka culture of the Ukrainian North-Pontic region through lipid residues analysis of pottery vessels. *Journal of Archaeological Science: Reports* 13 (2017) 67–74. doi: 10.1016/j.jasrep.2017.03.028.
- MILISAUSKAS, S. – KRUK, J. – HUDSON, K. 2019
Bronocice Funnel Beaker Vessel with Wagon Motif: Different Narratives. *Archaeologia Polona* 57 (2019) 233–240.
- NIELSEN, R. – AKEY, J. M. – JAKOBSSON, M. – PRITCHARD, J. K. – TISHKOFF, S. – WILLERSLEV, E. 2017
Tracing the peopling of the world through genomics. *Nature* 541/7637 (2017) 302–310. doi: 10.1038/nature21347.
- NIKITIN, A. G. 2019
Anatolian Neolithic Migration to Europe from an Archaeogenetic Standpoint. In: Stadler, P. – Kotova, N. (eds.): *Early Neolithic Settlement Brunn am Gebirge, Wolfholz, Site 2 in Lower Austria and the Origin of the Western Linear Pottery Culture (LPC). Volume I. Early Neolithic Settlement Brunn am Gebirge, Wolfholz, in Lower Austria*. Langenweissbach & Wien: Beier & Beran. Archäologische Fachliteratur 2019, 593–595.
- NIKITIN, A. G. 2020
The genetic landscape of Ukraine from the Early Holocene to the early metal ages. In: Lillie, M. C. – Potekhina, I. D. (eds.): *Prehistoric Ukraine*. Oxford: Oxbow Books 2020, 327–342. doi: 10.2307/j.ctv13nb9rs.15.
- NIKITIN, A. G. – NEWTON, J. R. – POTEKHINA, I. D. 2012
Mitochondrial haplogroup C in ancient mitochondrial DNA from Ukraine extends the presence of East Eurasian genetic lineages in Neolithic Central and Eastern Europe. *Journal of human genetics* 57/9 (2012) 610–612. doi: 10.1038/jhg.2012.69.
- NIKITIN, A. G. – IVANOVA, S. – KIOSAK, D. – BADGEROW, J. – PASHNICK, J. 2017
Subdivisions of haplogroups U and C encompass mitochondrial DNA lineages of Eneolithic–Early Bronze Age Kurgan populations of western North Pontic steppe. *Journal of Human Genetics* 62 (2017) 605–613.
- NIKITIN, A. G. – STADLER, P. – KOTOVA, N. – TESCHLER-NICOLA, M. – PRICE, T. D. – HOOVER, J. et al. 2019
Interactions between earliest Linearbandkeramik farmers and central European hunter gatherers at the dawn of European Neolithization. *Scientific Reports* 9/19544 (2019). doi: 10.1038/s41598-019-56029-2.
- NIKITIN, A. G. – VIDEIKO, M. – PATTERSON, N. J. – RENSON, V. – REICH, D. E. 2023
Interactions between Trypillian farmers and North Pontic forager-pastoralists in Eneolithic central Ukraine. *PlosOne* 18(6) (2023) e0285449. <https://doi.org/10.1371/journal.pone.0285449>
- NIKOLOV, V. 2016
The prehistoric salt-production and urban center of Provadia-Solnitsata, Northeastern Bulgaria. *Méditerranée* 126 (2016) 71–78. doi: 10.4000/mediterranee.8246.
- NIKOLOV, V. – PETROVA, V. 2016
Chapter 7. Tell karanovo: the hiatus between the Late Copper and the Early Bronze Age. In: Tsirtsoni, Z. (eds.): *The Human Face of Radiocarbon: Reassessing Chronology in prehistoric*

Greece and Bulgaria, 5000-3000 cal BC. Lyon: MOM Éditions 2016, 127–139. doi: 10.4000/books.momeditions.512.

NIKOLOVA, L. 2005

Social changes and cultural interactions in later Balkan prehistory later fifth and fourth millennia cal BC. In: Nikolova, L. – Fritz, J. – Higgins, J. (eds.): *Prehistoric Archaeology & Anthropological Theory and Education. Reports of Prehistoric Research Projects 6-7*. Salt Lake City, Karlovo 2005.

NOVAK, M. – OLALDE, I. – RINGBEUER, H. – ROHLAND, N. – AHERN, J. – BALEN, J. et al. 2021
Genome-wide analysis of nearly all the victims of a 6200 year old massacre. *PLoS ONE* 16/3 (2021) e0247332. <https://doi.org/10.1371/journal.pone.0247332>

OMRAK, A. – GÜNTHER, T. – VALDIOSERA, C. – SVENSSON, E. M. – MALMSTRÖM, H. – KIESEWETTER, H. et al. 2016

Genomic Evidence Establishes Anatolia as the Source of the European Neolithic Gene Pool. *Current Biology* 26/2 (2016) 270–275. doi: 10.1016/j.cub.2015.12.019.

OSTROVERKHOV, A. S. 2002

The earliest archaeological glass in Eastern Europe (late IV mill. – first half of VII cent. B.C.). *Stratum Plus* 2 (2002) 168–195.

PATOKOVA, E. F. – PETRENKO, V. G. – BURDO, N. B. – POLISCHUK, L. Y. 1989

Pamyatniki Tripol'skoj kul'tury v Cevero-Zapadnom Prichernomorje. Kiev: Naukova Dumka 1989.

PEEV, P. – FARR, R. H. – SLAVCHEV, V. – GRANT, M. J. – ADAMS, J. – BAILEY, G. 2020

Bulgaria: Sea-Level Change and Submerged Settlements on the Black Sea. In: Bailey, G. – Galanidou, N. – Peeters, H. – Jöns, H. – Mennenga, M. (eds.): *The Archaeology of Europe's Drowned Landscapes. Coastal Research Library, vol 35*. Springer Nature Switzerland AG 2020, 393–412. doi: 10.1007/978-3-030-37367-2_20.

PETRENKO, V. G. 1997

Zoloto i serebro v eneolite Severo-Zapadnogo Prichernomor'ya. In: *Novyye stranitsy drevney istorii Yuzhnoy Ukrainy: tezisy dokladov mezhdunarodnoy konferentsii*. Nikolaev: Vozmozhnosti Kimmerii 1997, 31–32.

PETRENKO, V. G. 2009

Problema «Tripol'ye i step'» i pamyatniki eneolita — ranney bronzy Severo-Zapadnogo Prichernomor'ya. *Materialy po arkheologii Severnogo Prichernomor'ya* 9 (2009) 10–38.

PETRENKO, V. – GERLING, C. – KAISER, E. 2018

Majaki – ein komplexes Denkmal der Usatovo-Kultur. Isotopendaten werfen neue Fragen auf. In: Hansen, S. – Wagner, M. (eds.): *Eurasia Antiqua. Zeitschrift für Archäologie Eurasiens*. Bonn: Rudolf Habelt Verlag 2018, 45–74.

PETRUN', V. F. 2000

Nizhneye Podnestrov'ye kak etalon arkheologo-petrograficheskogo poligona. In: *Chobruchskiy arkheologicheskiy kompleks i drevniye kul'tury Podnestrov'ya. Materialy polevogo seminara*. Tiraspol 2000, 178–182.

POPOV, S. – DIMOV, T. 2019

Predpolagayemye morskoye svyazi mezhdru Prikaspiyem i Severo-Zapadnym Prichernomor'yem v period khalkolita. In: *Vestnik Moskovskogo gosudarstvennogo oblastnogo universiteta. Seriya: Istoriya i politicheskiye nauki* 5 (2019) 27–40.

RADIOVOJEVIČ, M. – ROBERTS, B. W. 2021

Early Balkan Metallurgy: Origins, Evolution and Society, 6200–3700 BC. *Journal of World Prehistory* 34/2 (2021) 195–278. doi: 10.1007/s10963-021-09155-7.

RASSAMAKIN, Y. Y. 1996

On early elements of the Globular Amphora culture and other Central European cultures in the Late Eneolithic of the Northern Black Sea region. *Baltic-Pontic Studies* 4 (1996) 112–132.

RASSAMAKIN, Y. Y. 1999

The eneolithic of the Black Sea Steppe: Dynamics of cultural and economic development 4500–2300 BC. In: Levine, M. – Rassamakin, Y. – Kislenko, A. – Tatarintseva, N. (eds.): *Late Prehistoric Exploitation of the Eurasian Steppe*. Oxford 1999, 59–183.

RASSAMAKIN, Y. Y. 2009

New radiocarbon dates to the absolute chronology of Eneolithic of the Black Sea steppe (preliminary analysis). *Arkheologicheskiy al'manakh* 20 (2009) 289–296.

REZEPKIN, A. D. 1989

Severo-Zapadnyy Kavkaz v epokhu ranney bronzy (po materialam pogrebal'nykh pamyatnikov novosvobodnenskogo tipa). Sankt Peterburg University 1989.

REZEPKIN, A. D. 1991

Kurgan 31 mogil'nika Klady. Problemy genezisa i khronologii maykopskoy kul'tury. In: *Drevniye kul'tury Prikuban'ya (po materialam rabot v zonakh melioratsii Krasnodarskogo kraya)*. Leningrad: Nauka 1991, 167–197.

ROTEA, M. – NETEA, M. – DE-LA-RUA, C. – TECAR, T. – HERVELLA, M. – ALONSO, S. et al. 2014

The archaeological contexts of DNA samples collected from prehistoric sites in Transylvania. *Acta Musei Napocensis* 51/1 (2014) 21–60.

RYNDINA, N. V. 2002

Fenomen «serebristyykh» pokrytiy na izdeliyakh iz mysh'yakovykh splavov rannego bronzovogo veka (yug Vostochnoy Yevropy). In: *Drevneyshiye obshchnosti zemledel'tsev i skotovodov Severnogo Prichernomor'ya (V tys. do n. e. – V vek n. e.). Materialy III mezhdunarodnoy konferentsii; Tiraspol', 5–8 noyabrya 2002 g.* Tiraspol 2002, 92–96.

SERGEYEV, Y. P. 1969

Pozdnetripol'skiy klad zhenskikh ukrasheniy iz s. Ketroschika. Trudy gosudarstvennogo istoricheskogo muzeya Moldovy. In: *Trudy gosudarstvennogo istoricheskogo muzeya moldovy Moldovy*. Kishinev: Kartya Moldovenyaska 1969, 84–87.

TELEGIN, D. Y. 1986

Dereivka. A Settlement and Cemetery of Copper Age Horse Keepers on the Middle Dnieper. Oxford: British Archaeological Reports 1986.

TODOROVA, H. – VAISOV, I. 1993

Novo-kamennata epokha v Blgaria. Sofia: Nauka i iskustvo 1993.

WANG, C. C. – REINHOLD, S. – KALMYKOV, A. – WISSGOTT, A. – BRANDT, G. – JEONG, C. et al. 2019

Ancient human genome-wide data from a 3000-year interval in the Caucasus corresponds with ecogeographic regions. *Nature Communications* 10/1 (2019) 590.

WILDE, S. – TIMPSON, A. – KIRSANOW, K. – KAISER, E. – KAYSER, M. – UNTERLÄNDER, M. et al. 2014

Direct evidence for positive selection of skin, hair, and eye pigmentation in Europeans during the last 5,000 y. *Proceedings of the National Academy of Sciences of the United States of America* 111/13 (2014) 4832–4837. doi: 10.1073/pnas.1316513111.

YENER, K. A. 2000

The Domestication of Metals: The Rise of Complex Metal Industries in Anatolia. Boston & Köln: Brill 2000.

ZBENOVICH, V. A. 1974

Posdnetripols'kie Plemena Severnogo Prichernomor'ya. Kyiv 1974.

Yamnaya group from the Peschany IV burial ground in the Lower Don Eurasian steppes: local or non-local?

NATALIA SHISHLINA – ALEXEY KAZARNITSKY – NADEZHDA LEONOVA –
OLGA KUZNETSOVA – VYACHESLAV SEVASTYANOV

Abstract

This paper discusses the Yamnaya burials from the Peschany IV burial ground located in the Remontnoye district, Rostov region, Russia. According to the radiocarbon dating, approximately in 2900–2700 cal BC a Yamnaya group inhabited the steppe valley of the Dzhurak-Sal River. They built several kurgans in which humans of both sexes and all ages were buried. Specific features of their funerary rite include wooden constructions, plant mats and pillows stuffed with plants. The carbon and nitrogen isotopic composition of bone collagen of an old man, a woman, and children retrieved from the burials demonstrates low variation. In our view, this local Yamnaya group developed a special subsistence system and exploited a rather small area.

Key words: Sal-Manych Ridge, Yamnaya culture, subsistence system, radiocarbon dating

Introduction

The Bronze Age of Eurasian Steppe lasted roughly from 3500 to 1500 cal BC. One of the main cultures of the Early Bronze Age is the Yamnaya culture, the chronological interval of it falling within 3200/3100–2600 cal BC (SHISHLINA 2008).

Archaeological studies of the Yamnaya culture have found that, despite common features, the rites used by different regional Yamnaya groups demonstrate some distinctive traditions with different funerary assemblages, and special features in arranging burial mounds within a sacred landscape. Besides, the analysis of the burials from some burial grounds provides an opportunity to discuss resources that could have been used and were actually used by certain local groups to meet their material and cultural needs. Various natural resources (soil, pasture, wood, stones, etc.) exploited in the southern part of the Russian Plain were reflected in the human material culture (sets of artefacts made of bone, clay, metal, stone, plant and animal fibre, and other natural materials). The resources people needed for their everyday life activities as well as their funerary rites could be obtained locally or, if not available in the area where people lived, were, probably, brought from other regions. Variations in the carbon and nitrogen isotopic composition of bone collagen from humans, wild and domestic animals enable us to define the main components of their subsistence system and thus delineate the exploited areas.

In this paper, we introduce the analyses of the Yamnaya graves from the Peschany IV burial ground located in the Remontnoye district, Rostov Region (kurgans 11, 13, 16 and 21), craniological and isotopic analyses of Yamnaya humans. We believe that the analyses of Yamnaya graves left by local group of population could provide important information about the local subsistence system. The carbon ($\delta^{13}\text{C}$) and nitrogen ($\delta^{15}\text{N}$) isotopic composition of bone collagen from animals retrieved from the Yamnaya graves and the Temrta seasonal site located in the Sal-Manych Ridge area are used as baselines. The

comparative analysis of $\delta^{15}\text{N}$ and $\delta^{13}\text{C}$ values for the Yamnaya humans from Peschany IV and other kurgans located in the Sal-Manych Ridge (Peschany V, Temrta IV, and Ulan IV) provided an opportunity to discuss possible localization of food resources used by the studied local group. We also obtained AMS ^{14}C measurements of the human and animal bones as well as wood from Peschany IV graves and determined the time of its use.

Environmental context

Peschany IV is located in the Remontnoye district, Rostov region, 6 km southeast of the village of Remontnoye on a small watershed plateau between the Dzhurak-Sal river and a temporary stream valley known as the Peschanaya *balka* (Fig. 1). The steppe valley of the Dzhurak-Sal river (which is a tributary of the Sal river) is wide and is cut by *balkas* (Fig. 2). A *balka* is a steppe small river valley with well-defined Holocene terraces 5–7 m high, which is dry most time of the year. The flow of most *balka* rivers is made up of melt waters; therefore, *balkas* have full-flowing streams only in spring. Some *balkas*, though, are fed by groundwater and have an all-year flow, running dry only in the driest summers. The steppe *balkas* extend from the west to the east and can be quite vast with a flood-plain as wide as 1 km. The main type of vegetation in *balkas* is gramineous plants-wormwood associations.

Paleosol characteristics of the Yamnaya kurgans demonstrate that light chestnut soils with various degrees of alkalinity were widespread throughout the Yamnaya period, the precipitation rate in the region was 370–390 mm/year (ALEKSEEVA *et al.* 2007; KALININ – ALEKSEEV – LESSY 2009). Identification of the plant remains preserved in this areas indicate to the predominance of graminouse plants and wormwood associations during the Yamnaya period (SHISHLINA 2008).



Fig. 1. Sal-Manych Ridge – the area of the research

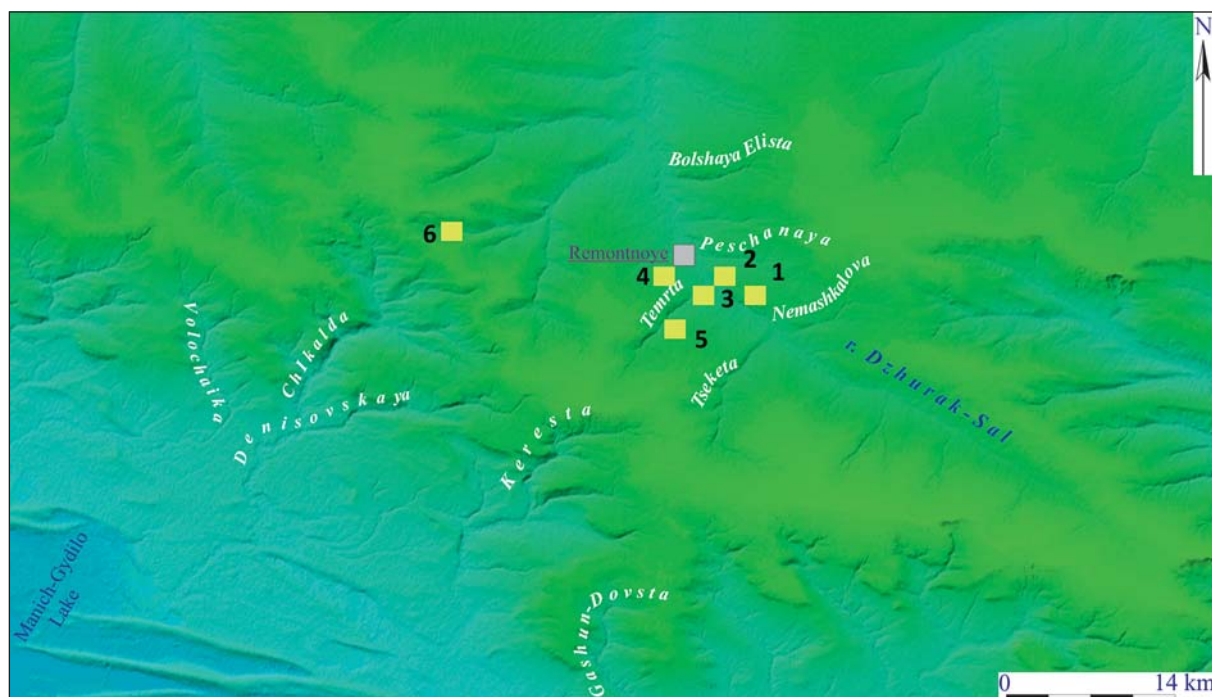


Fig. 2. Sal-Manych balka system. Locations of the sites: 1. Peschany IV, 2. Peschany V, 3. Temrta I, 4. Temrta IV, 5. Temrta seasonal camp site, 6. Ulan IV

The main subsistence activity of the Yamnaya population was pastoralism. It was a distinctive economic model with the use of new principles of rotation of pastures, landscape use and individual mobility (SHISHLINA 2008).

Local funerary rites

The reconstructed Yamnaya funerary rites of Peschany IV are presented below.

Kurgan mounds. All primary graves are located in the centre of the kurgans, secondary burials were added into different parts of the mound. The average diameter of the primary kurgans is approximately 14.0–20.0 m and their height is 0.5–1.0 m. Most kurgans were round-shaped.

Kurgan 11. There is a small oval ditch running around the northern side of the kurgan. Primary Yamnaya grave 4 was located in the centre. Secondary Yamnaya grave 6 overlies the primary grave and is parallel to primary grave 4.

Kurgan 13. Primary Yamnaya grave 6 was located in the centre. Secondary Yamnaya grave 5 overlies the primary grave.

Kurgans 16 and 21. Small oval kurgans 0.5–0.8 m high with a diameter of 8.0–10.0 m were constructed over the primary Yamnaya graves.

The Yamnaya mounds were used in the subsequent periods: secondary Catacomb and Sarmatian burials were added into different parts of the mounds.

Burial constructions. The predominant burial construction of all Yamnaya graves is a rectangular pit (Fig. 3.2). Grave 4, kurgan 16 was constructed in a rectangular pit with ledges in the walls (Fig. 3.1).

The pit was roofed with wood beams; there were plant mats and pillows stuffed with steppe plants placed inside the pit.

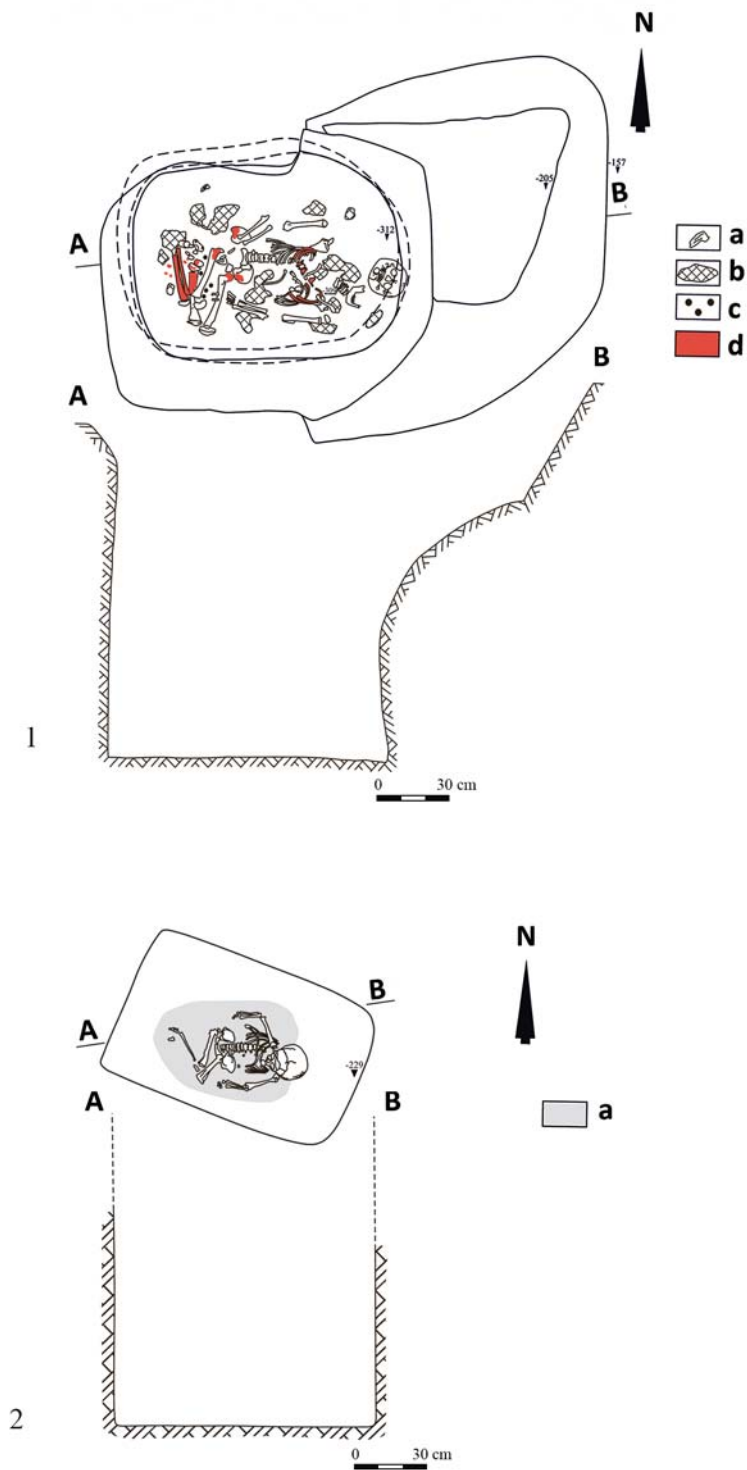


Fig. 3. Peschany-IV kurgan burial ground. 1. kurgan 16, burial 4, plan (a. wood fragments, b. mat, c. charcoal, d. red pigment), 2. kurgan 21, burial 3, plan (a. mat)

Fragments of oval wooden blocks rectangular in section and wedge-shaped blocks with a transverse kerf were found in the fill of rectangular grave 4, kurgan 11, in the centre of the pit (Fig. 4.1); vertically

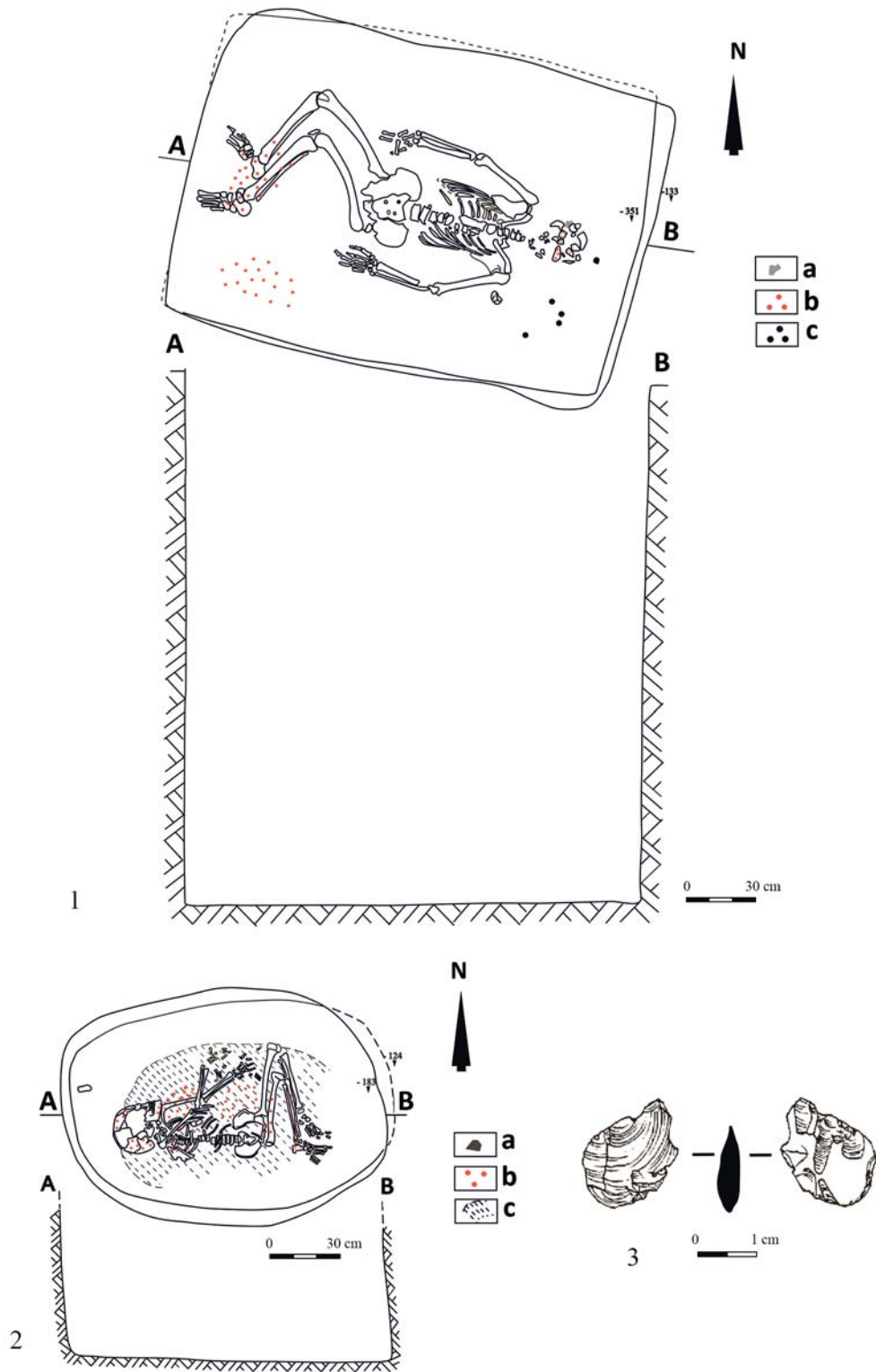


Fig. 4. Peschany IV kurgan burial ground. 1. kurgan 11 burial 4, plan (a. sheep astragals, b. red pigment, c. mat); kurgan 11, burial 6: 2. plan, 3. flint flake

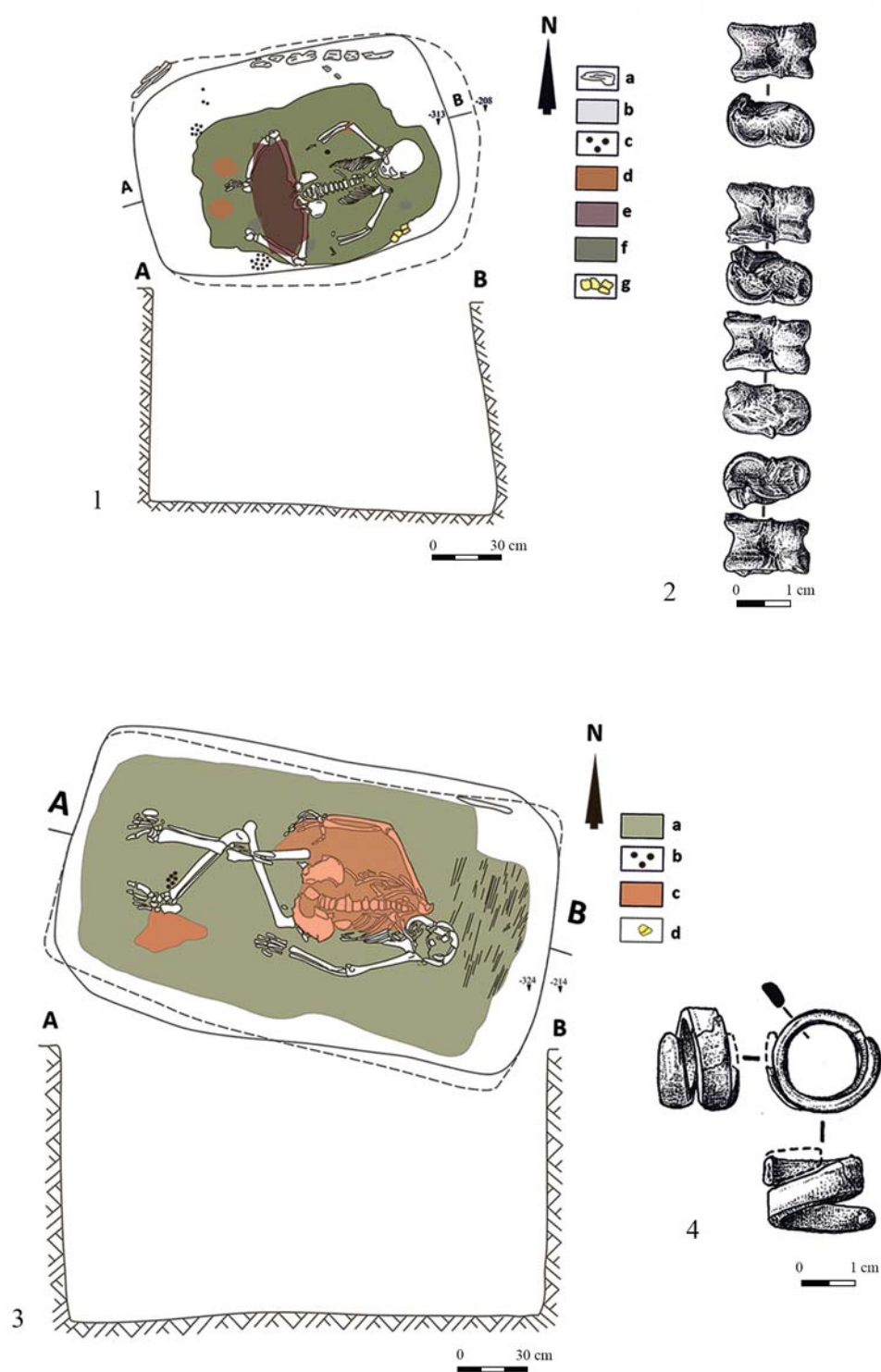


Fig. 5. Peschany IV kurgan burial ground. 1. kurgan 13, burial 6, plan (a. wood fragments, b. mat, c. charcoal, d. red pigment, e. plant 'coverlet', f. organic, g. sheep astragals), 2. sheep astragals; kurgan 13, burial 5: 3. plan (a. mat, b. charcoal, c. red pigment, d. bone hair ring), 4. temporal bone pendant

standing blocks were found near the walls in the bottom. This means that either the pit had a roof of a rather sophisticated design made up of wood, or a wooden framework was erected over the skeleton. The fill of grave 6, kurgan 13 (*Fig. 5.1*) revealed small wood fragments; two long wood fragments were preserved in the northwestern corner and along the northeastern wall. It might mean that a wooden construction was made over the grave. It was, probably, supported by round wooden poles, decayed remains of which were preserved seven centimeters south of the left shoulder and near the calcaneal bone of the left foot. A plant ‘coverlet’ covering the leg bones survived on the skeleton: twigs or fibres were located perpendicular to the backbone. It is quite possible that this coverlet was supported by wooden poles, but subsequently it fell on the skeleton. The rectangular pit of secondary grave 5, kurgan 13 (*Fig. 5.3*), was roofed with beams some fragments of which were retrieved from the grave fill and the northeastern corner. Imprints of the twigs were identified on the north wall near the bottom, a wood fragment was found in the fill. It is possible that the ledged pit of grave 4, kurgan 16, was also roofed with wooden beams or blocks.

Grave 6, kurgan 11, had a plant mat of 90×60 cm lying on the bottom (*Fig. 4.2*); the size of quadrangular mats found in grave 6, kurgan 13, and grave 4, kurgan 16, is 102×74 cm and 54×85 cm, respectively.

The pillows were rather large and when the stuff that filled them disintegrated, the skulls of the dead rolled to the side (grave 6 and grave 5, kurgan 13; grave 4, kurgan 16).

Therefore, practically all Yamnaya graves at Peschany IV were roofed with sophisticated wooden structures, or maybe, a framework supported by vertical poles was erected over the deceased person; the walls were probably reinforced with plaited twigs whereas the bottom was covered with plant mats and pillows. Phytolith identification of plant remains indicates that these plant mats were made from stem and leaves of reed and non-identified plants.

The position of the dead. A typical posture of the deceased is a supine posture with extended arms with raised legs and the head facing the east or southeast. It was only burial 6 in kurgan 11 where a child’s body was oriented to the west.

Funerary offerings include sheep astragals (*Fig. 5.2*) and a flint chip (*Fig. 4.3*). An original bone temple ring turned into 1.5 coils (*Fig. 5.4*) was found in the woman’s grave in kurgan 13, burial 5.

The use of red pigment to sprinkle the legs, the head and the upper part of the body is typical for almost all burials.

Anthropological analyses

The number of skeletons from Peschany IV burial ground is not representative yet. The analysed samples include one male, one female and five children (*Table 1*).

Table 1. Peschany IV burial ground. Age and sex of individuals

context	age at death (years)	sex
kurgan 11, grave 4, primary	45-55	male
kurgan 11, grave 5, secondary	9-11	-
kurgan 13, grave 6, primary	6-7	-
kurgan 13, grave 5, secondary	45/55>55	female
kurgan 16, grave 4, primary	~7	-
kurgan 16, grave 4, primary	under 1 year	-
kurgan 21, grave 4, primary	2 (±8 months)	-

However, it should be noted that the number of children in the Peschany IV Yamnaya group is not typical for anthropological series of the Yamnaya culture (GROMOV – KHOKHLOV 2018); moreover, the children were of different age: a baby under 1 year, a child aged 1–3 years, two children aged 5–9 years and a child aged 9–12 years. Both the adult male and the female were 45–55 years old or above 55.

The number of skulls from Peschany IV and the state of their preservation still do not allow us to specify their cranio-facial characteristics. Nevertheless, excavations of the Bronze Age kurgans at the village of Remontnoye in the Sal-Manych Ridge have been carried out for more than fifteen years, and large-scale investigation of the kurgan grounds in the northwestern Caspian steppes region has been under way for many decades. The first publications of cranio-facial data showed that the series of the Yamnaya locals were unique compared with other skull series from the North Black Sea steppes and the Volga region (SHEVCHENKO 1974). This conclusion was later confirmed, as new human remnants were collected, and wider intergroup comparative analyses were conducted (ALEKSEEV 1983; SHEVCHENKO 1986; KHOKHLOV 2006; 2017; GERASIMOVA 2011; KAZARNITSKY 2014).

It appears that in the Early Bronze Age there existed a distinctive Yamnaya group in the northwestern Caspian steppes region including the Sal-Manych Ridge. It is characterised by a wide brain case, wide frontal and orbital breadth combined with prominent nasal bones, a high nose bridge and facial profile, which is not sharply pronounced in the upper part. This morphological feature may be a result of a long-term residence of the studied human group in one place, if the group was large enough to maintain its reproduction; another determinant of this specific morphological feature is, most likely, relative isolation of this group from inhabitants in the neighbouring regions, though the funerary rites of the Sal-Manych Yamnaya group and the Yamnaya groups settled in other regions share some common features (KHOKHLOV 2006).

Local Yamnaya paleodiet

The collagen extraction from the human bones was done at the ^{14}C laboratory of the Institute for the History of Material Culture (IIMK) of the Russian Academy of Sciences. Stable isotope ratio measurements of collagen and plant remains were made at the Vernadsky Institute of Geochemistry and Analytical Chemistry (GEOKHI) of the Russian Academy of Sciences using a DELTA Plus XP isotope mass-spectrometer (ThermoFinnigan) linked to a Flash EA 1112 elemental analyzer. The isotope ratios are reported in permil notation relative to VPDB and AIR for $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$, respectively. Each sample was measured in triplicate and the standard deviation of repeated measurements was 0.2‰ and 0.2 to 0.3‰ for $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$, respectively. Collagen integrity was assessed by the atomic C/N ratio (SCHOENIGER – DENIRO 1984).

$\delta^{15}\text{N}$ and $\delta^{13}\text{C}$ data of bone collagen from the individuals buried in the Yamnaya kurgans at Peschany IV are provided in *Table 2* along with the data on the animals from the Yamnaya graves and the Temrta seasonal site. *Table 2* also includes isotope data for the plant mats from Yamnaya kurgan 17, Peschany IV. The previously published data on the isotopic composition of bone collagen from kulan and saiga (wild animals from the steppes) retrieved from the Catacomb sites in the studied region and plants from the Yamnaya graves are used for comparison as a local isotopic baseline (SHISHLINA – SEVASTYANOV – KUZNETSOVA 2018; SHISHLINA *et al.* 2020).

Table 2. $\delta^{15}\text{N}$ and $\delta^{13}\text{C}$ data for the Yamnaya humans, and plants and animals from Sal-Manych Ridge

Sample	$\delta^{13}\text{C}$, ‰ VPDB	$\delta^{15}\text{N}$, ‰ AIR	C:N
Peschany IV			
kurgan 11, grave 4, male 45-50	-15.3 ± 0.3	16.6 ± 0.3	3.2 ± 0.2
kurgan 13, grave 5, female 45-55	-16.2 ± 0.25	17.7 ± 0.25	3.2 ± 0.1
kurgan 13, grave 6, child 6-7	-16.5 ± 0.25	16.6 ± 0.3	3.2 ± 0.1
kurgan 16, grave 4, child 7	-16.4 ± 0.3	16.6 ± 0.2	3.2 ± 0.2
kurgan 11, grave 4, sheep bone	-17.5 ± 0.35	11.4 ± 0.3	3.2 ± 0.15
kurgan 17, grave 5, plant mat (stem and leaves of read)	-18.8 ± 0.4	5.1 ± 0.2	4.4 ± 0.2
kurgan 17, grave 5, plant mat	-12.2 ± 0.3	6.5 ± 0.3	4.5 ± 0.25
Temrta seasonal site			
sample 77, large ungulate	-20.0 ± 0.25	7.4 ± 0.3	3.0 ± 0.1
sample 74, kulan	-20.4 ± 0.3	6.3 ± 0.25	3.2 ± 0.1
sample 79, horse	-22.7 ± 0.35	6.2 ± 0.3	3.0 ± 0.15
sample 73, cattle	-19.2 ± 0.25	9.4 ± 0.3	3.1 ± 0.1
Peschany-V			
kurgan 15, barrow mound 2, sheep	-20.6 ± 0.35	15.8 ± 0.3	3.2 ± 0.1
Temrta-I			
kurgan 1, grave 9, sheep	-17.5 ± 0.2	10.7 ± 0.25	3.3 ± 0.1

Figure 6.1 clearly shows that the analysed individuals of all ages from Peschany IV have a specific isotopic composition of bone collagen characterised by elevated $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ values. It may be explained by a number of factors, such as climate aspects typical for this regional landscape zone (mixed plant pastures in the Peschanaya *balka* and soil salinity), a specific subsistence system of the studied local Yamnaya group and fodder of their domestic animals. This hypothesis is confirmed by variations in the nitrogen and carbon isotope composition of two plant mats from the Yamnaya grave in kurgan 17 of the same burial ground (one mat is made up of the arid C_4 plants) and as well as variations of the isotopic composition of bone collagen from domestic animals. Some animals fed on pastures where C_3 plants prevailed, while others, for instance, sheep from kurgan 11 at Peschany IV, kurgan 15 at Peschany V, and kurgan 1 at Temrta I, fed on either mixed C_3 - C_4 vegetation pastures or arid C_4 pastures (Table 2). The pasture area of wild ungulates (kulan, saiga) overlapped with the steppe niches where the local Yamnaya pastures were located.

Radiocarbon dating

Various carbon-rich materials, such as human and sheep bones, and wood were selected for AMS-dating of the Yamnaya graves at Peschany IV. All samples were dated at the University of Groningen Centre for Isotope Research, the Netherlands.

Radiocarbon data obtained and the weighted average date for Peschany IV Yamnaya kurgans were calibrated using the calibration curve (IntCal20) (REIMER *et al.* 2020) (Table 3).

The results show that the radiocarbon age of all human bones is practically the same; human and sheep bones from burial 4, kurgan 11; the human bone and wood from burial 6, kurgan 13, also demonstrate the same radiocarbon age.

The mean radiocarbon date is 4176 ± 13 ; the calibrated observation is 2880–2676 cal BC (sigma 2).

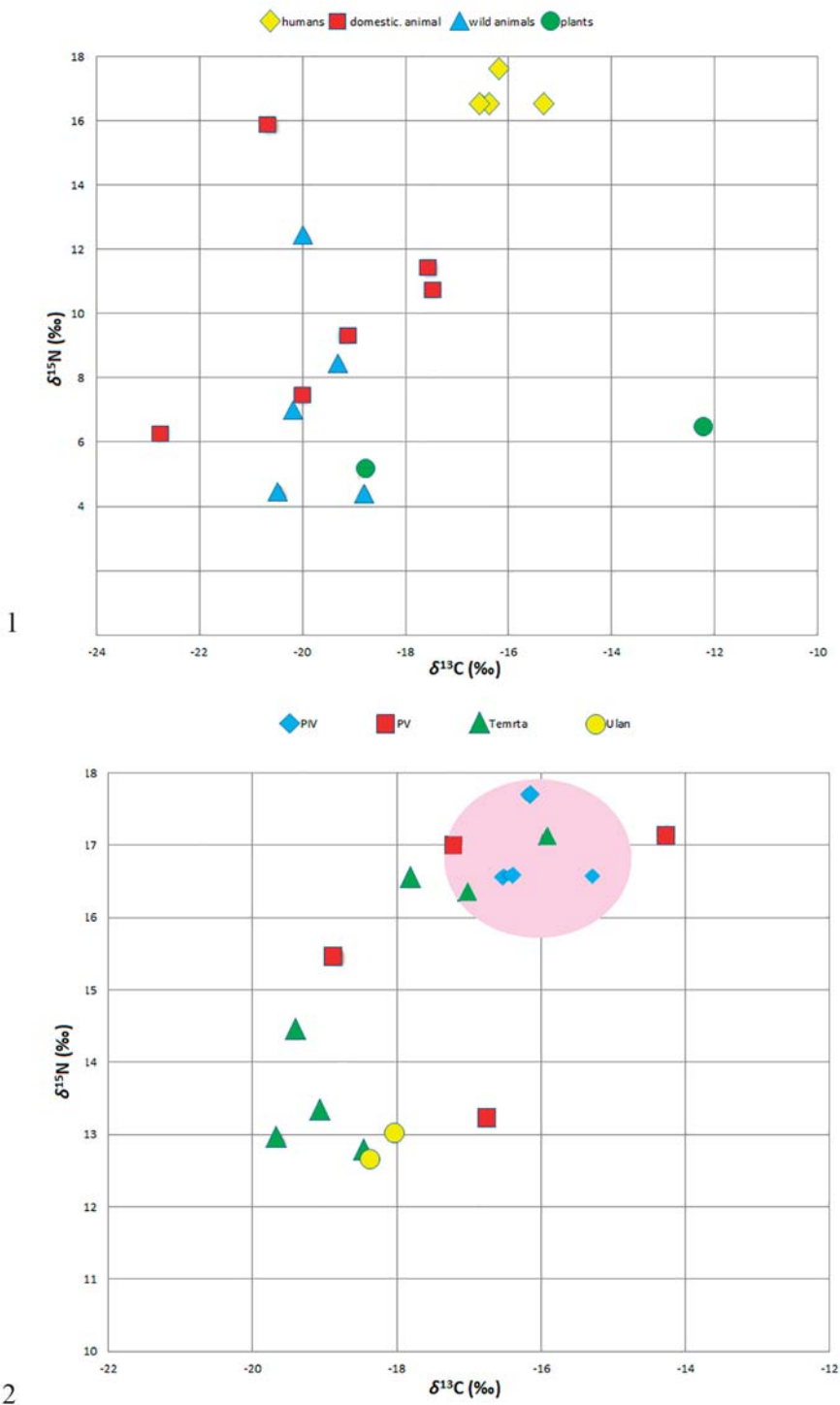


Fig. 6. Yamnaya culture of the Salsk-Manych Ridge. 1. $\delta^{15}\text{N}$ and $\delta^{13}\text{C}$ isotopic composition of human and animal bone collagen and plant remains from Peschany IV, 2. $\delta^{15}\text{N}$ and $\delta^{13}\text{C}$ isotopic composition of humans from Peschany IV, Peschany V, Temrta IV and Ulan IV. Pink oval indicates the isotope values of humans from Peschany IV

Table 3. Radiocarbon dating of samples from Peschany IV (SHISHLINA *et al.* 2021)

No.	Lab №	sample/ age	kurgan/ grave	^{14}C (BP)	Calibrated ^{14}C (BC), 2 σ	$\delta^{13}\text{C}$, ‰ VPDB	$\delta^{15}\text{N}$, ‰ AIR
1	GrA67588	Human bone male 45-50	k. 11, g. 4	4180±35	2887–2632	–15.3	16.6
2	GrA67587	Sheep bone	k. 11, g. 4	4175±35	2886–2631	–17.5	11.4
3	GrA64621	Human bone child	k. 13, g. 5	4200±35	2899–2637	–16.2	17.7
4	GrA64624	wood	k. 13, g. 6	4145±35	2878–2585	–26.1	–
5	GrA64622	Human bone male	k. 13, g. 6	4130±35	2871–2579	–16.5	16.4
6	GrM16406	Human bone	k.16, g.4	4210±25	2899–2677	–16.4	16.6
Mean radiocarbon date				4176±13	2880–2676		

Discussion and conclusion

Our analysis clearly demonstrates that, most likely, a small local Yamnaya group, which included men, women and children lived in the Dzhurak-Sal river valley around 2900–2700 cal BC. This group buried its relatives using a funerary rite typical for other Yamnaya groups that inhabited the northwestern Caspian steppes, the Sal-Manych Ridge and the Lower Don region.

The only artefact that stands out from the rest of the funerary offerings is a bone spiral hair ring turned into 1.5 coils, it is a forehead accessory that belonged to the elderly woman from the studied sample. There are no analogies to this item. Bronze hair rings with open ends are a common find in the Yamnaya graves of the East Manych and the South Yergueni Hills (SHISHLINA 2008, Fig. 45. 1, 5, 6). Large bronze spiral hair rings turned into 1.5 coils appeared in the subsequent period in the steppe northern Caucasus burials (SHISHLINA 2008, Fig. 64. 14) as well as the East Manych and West Manych Catacomb burials (SINITSYN 1978).

The mapping of other Yamnaya burials located between the Sal and the Manych rivers, a recently discovered Yamnaya seasonal site in the Temrta *balka* as well as the available ^{14}C dates of the Yamnaya culture (SHISHLINA 2008; VAN DER PLICHT *et al.* 2016) show that early in 3000 cal BC the vast steppe areas of the Sal-Manych Ridge were quite densely populated. We think that their inhabitants exploited all resources of the steppe areas.

However, the isotopic markers of the subsistence system developed by the small Peschany IV Yamnaya group have shown some specific features of this local group's diet components.

The analysed isotopic composition of bone collagen from the individuals of the Peschany IV Yamnaya group and other contemporary Yamnaya groups inhabiting both the neighbouring areas (Peschany V) and other *balkas* (the Yamnaya Temrta I and Temrta IV kurgan burial grounds are located in the Temrta *balka* lying 8–10 km away from Peschany IV; Ulan-IV is located between the Denisovka *balka* and the Gorkaya Bugulta *balka* lying 30 km from Peschany IV) demonstrates large variations in the isotope values of the four Yamnaya groups: Peschany IV, Peschany V, Temrta I/Temrta IV and Ulan IV, which buried their relatives in the kurgans located either closely or quite far from each other. As is clearly shown in Figures 6, 2 and 7, the subsistence system of the local Yamnaya group that left behind Peschany IV is quite different from that of other Yamnaya populations that occupied other steppe *balkas* included in the analyses as reflected in their diet preferences. For example, the diet system of some Yamnaya individuals buried at Peschany V, Temrta IV included several typologically similar food

components with high values of $\delta^{15}\text{N}$ and $\delta^{13}\text{C}$. On the whole, the Yamnaya groups from Peschany V and Temrta IV are characterised by large variations in the nitrogen and carbon isotopic composition (Fig. 7). Elevated $\delta^{15}\text{N}$ values can inform about high share of animal products in human diet, especially fish, or other steppe components such mushrooms (SHISHLINA – SEVASTYANOV – KUZNETSOVA 2021). Individuals from Peschany IV exhibit such high $\delta^{15}\text{N}$ ratios. However, as their radiocarbon ages were not affected

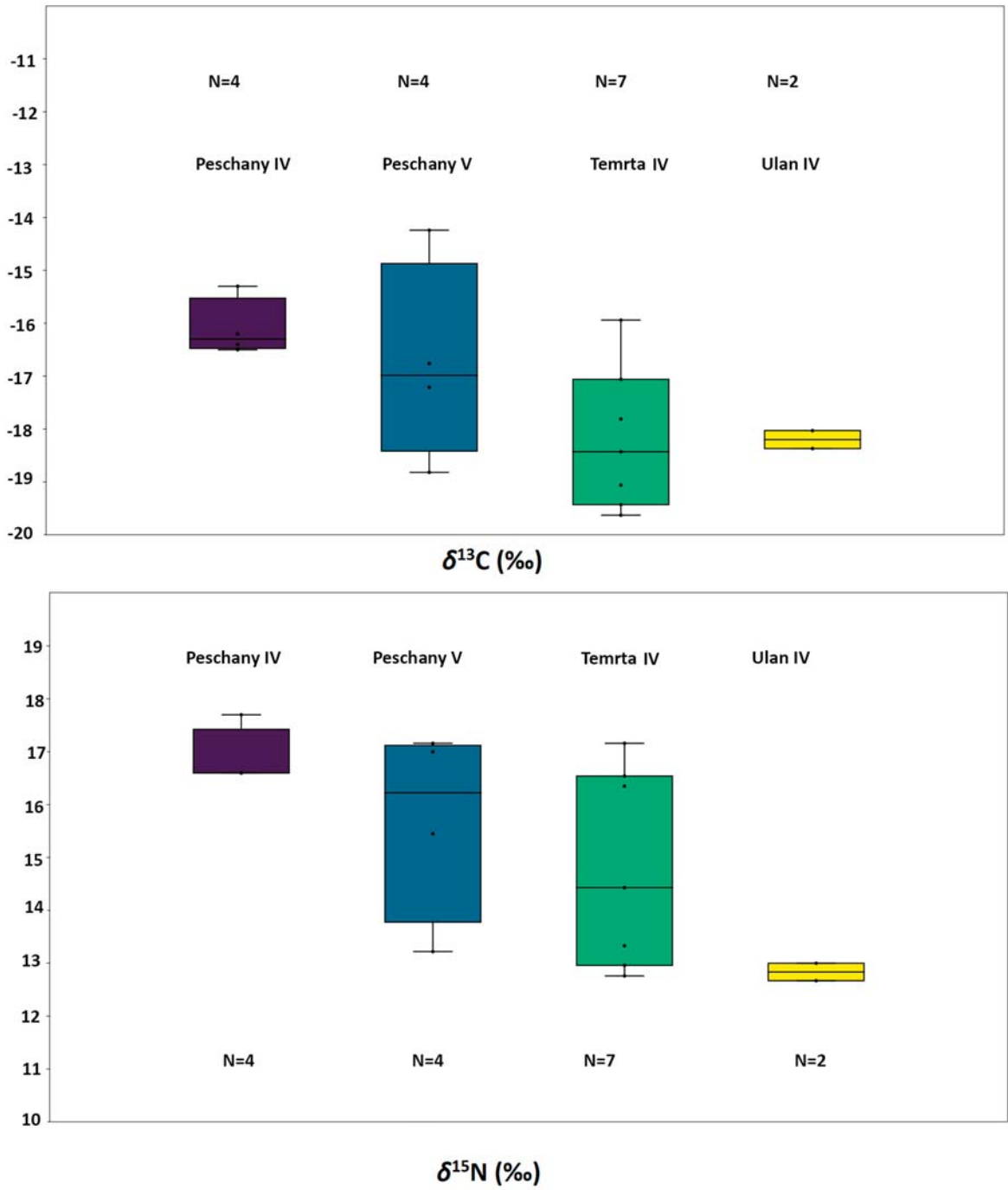


Fig. 7. Boxplots of $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ values of Yamnaya individuals from Peschany IV, Peschany V, Temrta IV and Ulan IV

by freshwater reservoir effect (VAN DER PLICHT *et al.* 2016) it can be concluded that their diet did not include significant amounts of aquatic foodstuffs.

The individuals from Peschany V located near Peschany IV also have elevated $\delta^{15}\text{N}$. However, the comparison of the radiocarbon age of these individuals and that of the terrestrial samples from the same grave show a clear offset up to 850 yr (VAN DER PLICHT *et al.* 2016) which means that the diet system of other Yamnaya groups, even those who lived nearby, could include freshwater components as well.

The lowest $\delta^{15}\text{N}$ and $\delta^{13}\text{C}$ values have been recorded for the Yamnaya group from Ulan IV (Fig. 7).

The earlier studies of the subsistence system developed by the Caspian steppes population in the Bronze Age led to the conclusion that the Yamnaya groups in this region had a multi-component diet. The stable isotope study of the human bones from the Caspian steppes found that a river fish component accounted for a large share in the diet system of the Yamnaya population in this vast region (SHISHLINA 2008; SHISHLINA *et al.* 2014). The new isotope data on the local Yamnaya individuals from Peschany IV located in the Sal-Manych steppes, which is a region located southwest of the Caspian steppes demonstrate that the local Yamnaya group had other preferences in its diet system. Based on the stable isotope data, the Yamnaya population groups inhabiting the Sal-Manych Ridge can be divided into several groups: those who consumed fish (Peschany V, Temrta IV), those who did not (Peschany IV) and those who preferred a mixed variant (Ulan IV).

The low variation and similar isotope values of bone collagen from the Peschany IV individuals (the elderly man and the woman, and the children aged 6–7 years) imply that the local Yamnaya group exploited quite a limited resource area. Strontium isotope ($^{87}\text{Sr}/^{86}\text{Sr}$) variations in the enamel of the two adult individuals buried at Peschany IV, and their comparative analysis with the local baseline samples (SHISHLINA 2023) confirm that at least some of the individuals were born in the area of the Peschanaya *balka* or nearby. It seems possible that the potential resource base exploited by this group was not large, and we consider all individuals buried in four kurgans of Peschany IV to be locals.

Acknowledgements

This work was supported by RSF grant No. 21-18-00026.

References

- ALEKSEEV, V. P. 1983
Bronze Age population of the Middle Don (craniology). In: Siniuk, A.T. (eds.): *Bronze Age Kurgans of the Middle Don*. Voronezh: Printed by Voronezh State University 1983, 183–191.
- ALEKSEEVA, T. – ALEKSEEV, A. – MAHER, B. A. – DEMKIN, V. 2007
Late Holocene climate reconstructions for the Russian steppe, based on mineralogical and magnetic properties of buried palaeosols. *Palaeogeography, Palaeoclimatology, Palaeoecology* 249/1–2 (2007) 103–127.
- GERASIMOVA, M. M. 2011
On origin of the Yamnaya culture. *Vestnik antropologii* 19 (2011) 104–111.
- GROMOV, A. V. – KHOKLOV, A. A. 2018
Sex-age structure of the people buried in early Bronze Age cemeteries of the Yamnaya culture in the Volga and Ural region. *Kunstkamera* 1 (2018) 78–86.

KALININ, P. I. – ALEKSEEV, A. O. – LESSY, A. D. 2009

Loesses, Paleosols and Paleogeography of Quaternary of Southeast of the Russian Plain. Voronezh: Voronezhskii gosudarstvennyi universitet Press 2009.

KAZARNITSKY, A. A. 2014

On the biological distinctness of the Pit-grave (Yamnaya) people in the northwestern Caspian: cranial evidence. *Eurasian archaeology, ethnography and anthropology* 1/57 (2014) 142–150.

KHOKHLOV, A. A. 2006

On craniological specialities of Yamnaya archaeological culture bearers in North-West Pre-Caspian area. *Vestnik antropologii* 14 (2006) 136–146.

KHOKHLOV, A. A. 2017

Morphogenetic processes in the Volga-Ural region in the early Holocene Age (based on Mesolithic-Bronze Age craniological materials). Samara: Samara State Social-Pedagogical University 2017.

VAN DER PLICHT, J. – SHISHILINA, N. I. – ZAZOVSKAYA, E. P. 2016

Radiocarbon dating. Chronology of archaeological cultures and reservoir effect. Moscow: Paleograph 2016.

REIMER, P. – AUSTIN, W. – BARD, E. – BAYLISS, A. – BLACKWELL, P. – BRONK RAMSEY, C. et al. 2020

The IntCal20 Northern Hemisphere radiocarbon age calibration curve (0–55 cal kBP). *Radiocarbon* 62 (4) (2020) 725–757.

SINITSYN, I. V. 1978

East Manych Antiquities (Drevnosti Vostochnogo Manycha). Vol. I-II. Saratov: Saratov University Publishing House 1978.

SCHOENINGER, M. J. – DENIRO, M. J. 1984

Nitrogen and carbon isotopic composition of bone collagen from marine and terrestrial animals. *Geochimica et Cosmochimica Acta* 48/4 (1984) 625–639.

SHEVCHENKO, A. V. 1974

Anthropological characteristics of the inhabitants of the Bronze Age Kalmykia. *Issues of safety, classification and use of archaeological sites. Reports VII* (1974) 199–203.

SHEVCHENKO, A. V. 1986

Anthropology of the Bronze-Age inhabitants of the South-Russian steppes. *Anthropology of modern and ancient inhabitants of the European part of the USSR* (1986) 121–215.

SHISHLINA, N. I. 2008

Reconstruction of the Bronze Age of the Caspian Steppes: Life Styles and Life Ways of Pastoral Nomads. British Archaeological Reports International Series 1876. Oxford 2008.

SHISHLINA, N. I. – SEVASTYANOV, V. – ZAZOVSKAYA, E. P. – VAN DER PLICHT, J. 2014

Reservoir effect of archaeological samples from steppe Bronze Age cultures in southern Russia. *Radiocarbon* 56/2 (2014) 767–778.

SHISHLINA, N. I. – SEVASTYANOV, V. – KUZNETSOVA, O. 2018

Seasonal practices of prehistoric pastoralists from the south of the Russian plain based on the isotope data of modern and archaeological animal bones and plants. *Journal of Archaeological Science: Reports* 21 (2018) 1247–1258.

SHISHLINA, N. I. – ROSLYAKOVA, N. V. – BACHURA, O. P. – KISELEVA, D. V. – KUZNETSOVA, O. V. 2020

Bronze Age shepherds and metallurgists: isotope data and reconstruction of seasonal migrations. *Ural Historical journal* 4/69 (2020) 15–23.

SHISHLINA, N. I. – SEVASTYANOV, V. S. – KUZNETSOVA, O. V. 2021

The diet system of the forest and steppe zone of Eastern Europe in the 4th–3rd millennia BC and dietary resources: interpretation of stable isotope data. *Ural Historical journal* 4/73 (2021) 50–59.

SHISHLINA, N. I. – LEONOVA, N. V. – KAZARNITSKY, A. A. – VAN DER PLICHT, J. – ROSE, N. 2021

Yamnaya culture burials of the Peschany IV burial ground from the Rostov region: funerary rite and chronology. *Issues of the Volga Archaeology* 9 (2021) 43–51.

SHISHLINA, N. I. 2023

Yamnaya pastoralists in the Eurasian desert steppe zone: new perspectives on mobility. In: Kristiansen, K. – Kroonen, G. – Willerslev, E. (eds.): *The Indo-European puzzle revisited*. Cambridge: Cambridge University Press, 2023, 34–41.

Budzhak “Culture” through the prism of the cartographic method

VALENTIN DERGACHEV

Abstract

Despite a huge number of specialists, there is no clear idea of the nomenclature status of the Yamnaya culture of the Carpathian-Dniester region, and, accordingly, understanding of their real place in the terminological structure. The analysis of some categories of grave goods (e.g. vessels of the Budzhak type, spiral temple rings, tubules, etc.) revealed their relationship with the funerary rite, as well as the specifics of distribution in the Carpathian-Dniester region. Since the groups of burials identified based on the funerary rite (having chronological significance), manifest themselves as relatively stable combinations of qualitative and quantitative indicators, they are a reflection of two main periods of the Yamnaya culture of the Carpathian-Dniester region. The burials of the Carpathian-Dniester region are an integral part of a complex cultural phenomenon like the Yamnaya (cultural and historical) community. Therefore, in terms of nomenclature, for the burials of the Carpathian-Dniester region, it would be more correct to formalise the status of a regional unit, with the term like Carpathian-Dniester regional variant of Yamnaya culture, by analogy with the Balkan, Tisza, Southern-Bug and others. Within the Carpathian-Dniester regional variant, two periods are clearly distinguished: early (Dniester) and late one (Budzhak).

Key words: Carpathian-Dniester region, Bronze age, Yamnaya culture, periodisation, mapping

Over the last decades, Eastern European and Western scholars re-emphasised the issues of Yamnaya culture between the Carpathians and the Dniester. The interest is caused by: 1) the location of this region that served as a contact zone between different cultural traditions associated with populations of Eastern, Southeastern and Central Europe; 2) increasing Yamnaya culture data from this area and neighbouring regions; 3) rapid and intensive accumulation of new data obtained from natural sciences (^{14}C , aDNA, etc.). These trends are reflected by generalisation on the Yamnaya culture in the Carpathian-Dniester region (e.g., SUBBOTIN 2000; 2003; IVANOVA 2001; 2001–2002; 2013a) and even more numerous studies of cultural-historic and interpretation character (e.g., IVANOVA 2012; 2013b; 2013c; 2016; IVANOVA – TOSCHEV 2015; KLOCHKO *et al.* 2015; KLEYN 2007; 2016; 2017; KAISER 2019). “And God realised that this is good” (Genesis 1: 31).

However, despite such a significant number of studies, experts still lack a clear understanding of the taxonomical status of the Yamnaya culture sites in the Carpathian-Dniester region and, therefore, lack a clear understanding of their meaning in terms of structural relations. In other words, by avoiding the understanding of sites through the data systematisation, numerous authors start dealing with general interpretations misinforming their colleagues (who are not familiar enough with the data) and provoking endless discussions.

Let me briefly explain this issue. By the end of 1960s – the beginning of 1970s, N.Ya. Merpert systematised the available data and identified spatial borders of Yamnaya sites. Integrated into the Yamnaya cultural complex, these sites are subdivided into nine relatively spatially distinct (local)

variations. Sites between the Carpathians and the Dniester were claimed to mark the southwestern variation of the cultural complex (MERPERT 1968, 14–15, 38–39; 1974, 12–14).

Twenty years later, after intensive field research and data accumulation, the first monograph, which was specifically focused on the understanding of the funeral rites of Yamnaya culture in the analysed region, was published (YAROVY 1985). Due to the analysis of available records and application of statistical methods, Yarovoy identified two relatively distinct horizons or periods within this dataset. The first horizon is mainly characterised by skeletons laid supine with legs raised at the knees (Group I). The second horizon is mainly characterised by skeletons laid on the back, with a more or less accentuated inclination on the right or left side (Group II) and, partly, strongly crouched on their left or right side (Group III) (YAROVY 1985, 44–49, 109).

A year after E.V. Yarovoy's book, my monograph dealing with the general characteristics of the Moldavian Bronze Age cultures was published. One of its parts was focused on the analysis and systematisation of Yamnaya culture burials (DERGACHEV 1986, 26–87). The dataset of a similar size (nearly 1200–1300 barrow burials) and the application of a different methodology brought up somewhat unexpected conclusions. The analysis identified the internal periodisation of the Yamnaya culture recorded in funeral rites and several categories of artefacts, which are characterised by stable correlations. The latter methodologically suggests objectively defined structural units. This makes possible the following conclusion.

The Yamnaya culture between the Carpathians and the Dniester includes two relatively distinct spatial and chronological variations or horizons.

The first, defined as the “Dniester” variation, represents the early development of this culture. It spread across the overall region and partly included the Lower Danube area. Its diagnostic characteristics are the supine position with the legs raised at the knees (usually they fall to the left or right side, or both sides, shaping a “rhombic” position), poor inventory: spiral-shaped rings made of silver or copper, vessels of spherical forms having two handles, anthropomorphic stone stelae and parts of wooden wagons.

The second, “Budzhak” variation represents the late period of this culture. Unlike the first variation, the second mainly spread in the steppe part of Dniester and Prut interfluvium. Its diagnostic characteristics are a position of the individuals on the back, with a more or less accentuated inclination on the right or left side (with a stable position of hands) and, partly, a significantly crouched position of bodies correlated with relatively rich inventory: vessels of different types, bracelets composed of copper plates rolled to a tube, wedge-shaped axes and bone arrowheads (DERGACHEV 1986, 74–87).

The results of the presented analyses regarding the chronological differentiation of burials attracted the interest of experts, especially young researchers dealing with barrows by its advantage to work with diagnostic criteria for the data analysis from numerous Yamnaya graves. Both studies influenced the introduction of the terms “ancient-Yamnaya” and “Yamnaya” burials (defining the body position in the grave) into scientific circulation in the 1980s–1990s. The terms were used to define chronologically different complexes. Both terms are currently still being used.

The division of the Yamnaya culture into two distinct chronological variations, Dniester and Budzhak, which are different not only in terms of the position of bodies, but also by materials of different categories, had a different history. This suggestion was discussed, cited, but remained weakly understood and not being used. Later on, this idea obtained a ritual sense, being just cited as an opinion in the history of research.

Knowledge on the Yamnaya culture between the Carpathians and the Dniester was influenced over the last 20 years by the work on this topic of S.V. Ivanova, which resulted in the publication of a significant number of papers.

According to Ivanova, Yamnaya sites in the Northwestern Black Sea area represent a distinct unit, the Budzhak culture ("in frames of Yamnaya cultural complex"), which is typical for the overall Carpathian – Dniester region (IVANOVA 2013a, 216). It should be noted that alternative, often very different interpretations (IVANOVA 2014) were also suggested by the same scholar (seeming to represent a certain uncertainty of such hypotheses) as it was pointed out by L. S. KLEYN (2016, 6).

S. V. Ivanova claims that the "Budzhak culture", of an evolution history reaching 900 years (3100/3000–2000/2100 BC), represents a relatively monotonous cultural unit, whose populations practiced the same funeral rites (characterised by the mentioned triad – supine position with legs raised at the knees, the position of the individuals on the back, with an inclination on the right or left side). Due to the long duration and external interactions, this culture includes a specific complex of data, to a higher or smaller degree typical for its overall span.

Discussing the state of the art, S. V. Ivanova notes that the "issues of internal chronology of Budzhak culture are weakly developed by the moment" (IVANOVA 2013a, 220). However, disregarding the unsound nature of the idea of a monotonous and continuous development of this culture for almost a millennium (characterised by significant cultural transformations including the replacement of many cultures and cultural complexes by each other), she assumes three possible stages in its development. Unfortunately, as in many other cases, this distinction seems to be based on the insubstantial use of the same diagnostic characteristics and parameters mainly representing funeral rites. Therefore, the meaning of these three stages remains fuzzy (IVANOVA 2013a, 219–223).

A more recent study of S. V. Ivanova states the division of this culture into two stages, *the Early* (3100-2600/2500 BC) and *the Late* (2600/2500-2200 BC) (IVANOVA 2020, 182). This statement represents nothing but a declaration because the division is not explained.

Now let us turn from the history of research to the important issues of Yamnaya sites in the analysed region. These are the internal chronology and periodisation of the Yamnaya culture and the taxonomic position of sites. The issues are approached through the analysis of artefacts belonging to three categories (representing ceramics and ornaments), which are considered in the context of the spatial distribution of sites.

Concerning the analysis of the spatial distribution of sites, it is important to emphasise the following. Mapping sites is one of the key methods of archaeological research. Every dissertation or book mentions its application. However, mapping sites very often results in one or two figures reflecting sites of some culture or category of finds. Applications of this methodology to more sophisticated tasks focused on the identification of the internal structural components of complicated units, such as the Yamnaya culture as a cultural complex or scaled to the Carpathian-Dniester region, are not known to me. Thus, let us demonstrate the advantages of the method.

First, let us consider vessels of the Budzhak type. This term is used since the early publications of this specific ceramic type (SHMAGLIJ – CHERNYAKOV 1970). Considering the general rarity of ceramics in Yamnaya complexes, this form belongs to quantitatively dominating types. Over 90 archaeologically complete vessels of Budzhak type are known from c. 3000 complexes.

This type of vessel is very specific because it is not known from earlier or later cultures in this region or synchronous cultures of neighbouring areas. This is the reason for marking these vessels to be "labels" of the Budzhak culture by S. V. Ivanova and other scholars. However, to what extent does this "label" label the culture?

Figure 1 represents the variability of all known vessels referred to Budzhak type. This figure illustrates cup-shaped or jar-shaped vessels, mainly conical or nearly cylindrical shape (*Fig. 1.7, 23*) with a more or less rounded body. With the only exception (*Fig. 1.10*), all of them have a flat bottom, while nearly half of vessels also have ring pallets (*Fig. 1.1–5, 7–8, 12–13, 19–21, 26*). Handles (distinct

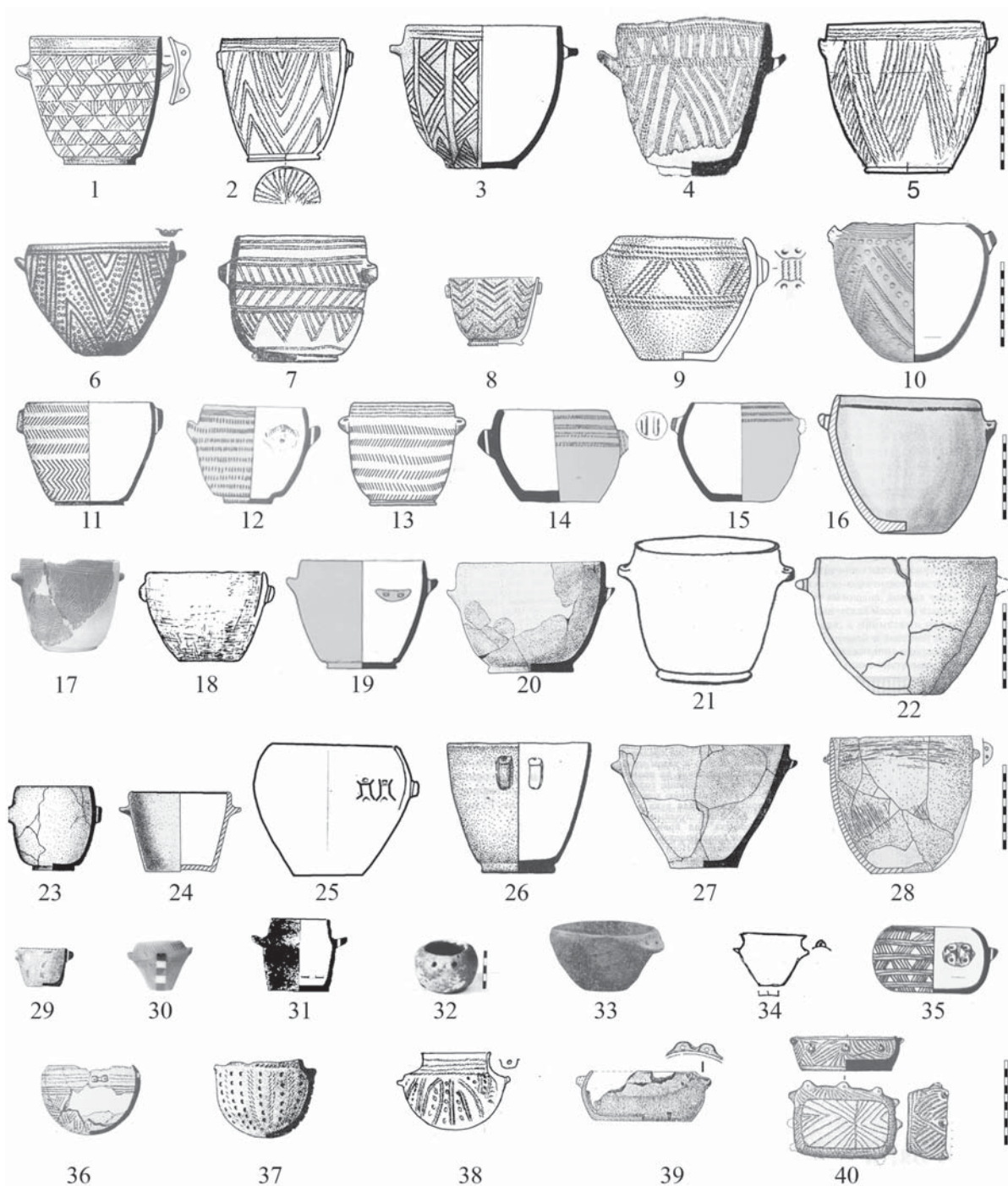


Fig. 1. Budzhak type vessels (1–16. ornamented; 17–30. non-ornamented; 31–40. derivatives). 1. Dubăsari 4/4, 2. Chervonyy Yar I, 1/2, 3. Diviziya II, 6/3, 4. Ursoaia 3/12, 5. Glubokoe 1/25, 6. Roșcani 1/13, 7. Grigorevka 1/12, 8. Berezchi, destroyed grave, 9. Svetlîi 3/10, 10. Mocra 1/3, 11. Sărăteni 6/4, 12. Mayaki III 9/1, 13. Efîmovka 3/5, 14–15. Trapovka 1/8, 16. Semenovka 19/4, 17. Murighiol 4/6, 18. Gura Bîcului 3/2, 19. Mayaki IV 1/1, 20. Răscăeșii Noi 2/12, 21. Bashtanovka 4/25, 22. Revova 3/7, 23. Crasnoe 9/23, 24. Giurgiulești 2/4, 25. Novokamenka 1/mound, 26. Nicolscoe 10/4, 27. Olănești 6/14, 28. Vlădești 1/2, 29. Olănești 1/26, 30. Yasski 6/14, 31. Sadovoe 1/14, 32. Polevoe 2/6, 33. Belyaevka 1/20, 34. Novaya Dolina 1/2, 35. Monashi 1/8, 36. Talmazha 3/15, 37. Olănești 13/2, 38. Novokamenka 1/5, 39. Dubăsarii Vechi 1/28, 40. Grigorăuca 1/8 (number of the kurgan/number of the grave) (See Annex I)

or placed in pairs) in the upper part of the vessel’s body are one of the mandatory morphological elements. Nearly two-thirds of these vessels are decorated by the imprints of cord (sometimes together with round incisions), which compose complex geometric (*Fig. 1.1–11*) or simple linear compositions (*Fig. 1.12–16*). In rare cases, bottoms were also decorated (*Fig. 1.2*).

From the metrical perspective (*Fig. 2*), these vessels represent a relatively compact “homogenous” group of artifacts with the height of 7.7–8 to 20 cm and maximal diameter of 8 to 20–20.5 cm. A relatively small group consists of secondary derived forms, represented by isolated items (about 12–15), differing in their small size, shape and configurations (*Fig. 1.32–40; Figs. 2, 3*).

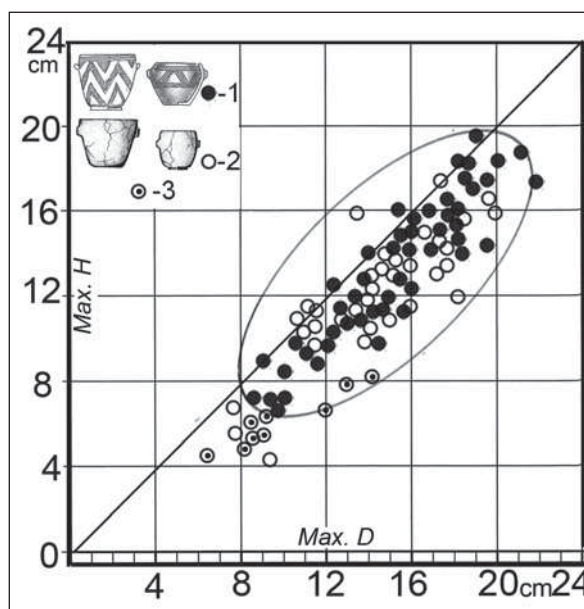


Fig. 2. Metric parameters of the Budzhak type vessels (vertical axis – maximal height, horizontal axis – maximal diameter). 1. ornamented, 2. non-ornamented, 3. derivatives

Let us consider the distribution of these vessels in space. The map (*Fig. 3*) represents all the locations related to Yamnaya culture in the Carpathian-Dniester region by small dots, while the solid line marks the borders of this cultural unit. Special signs mark the findings of Budzhak type vessels.

What does it tell us? All the finds of the analysed vessels are located exclusively in the steppe zone of the overall area. Most of their concentrations are located in the Lower Dniester region and near the Black Sea, in the Dniester and Prut interfluvium (*Fig. 3*). Except for three finds in the periphery of this area Mocra (N1), Grigorăuca (N29), and Brăviceni (N30), the area of the Yamnaya culture outside the analysed region does not have Budzhak type vessels.

Thus, the analysis shows that vessels “labelling” the Budzhak “culture” are typical only for the steppe zone, historically known as the Budzhak Steppe. This locational specificity approves the term used for our vessels, but not for the “Budzhak culture” according to S. V. Ivanova, sharing the cultural unit to the overall Carpathian-Dniester region (and, maybe, even wider?).

The logic of mapping is very simple. Partial or complete spatial correlation of the analysed phenomena could mean only their chronological difference (i.e. area of Budzhak type vessels represent a chronological horizon when compared to Yamnaya culture spread between Carpathians and Dniester). Now we should identify the sequence of these phenomena. However, let us first return to the vessels and analyse their context, i.e. specifics of burial rites characterising complexes where such vessels were found.

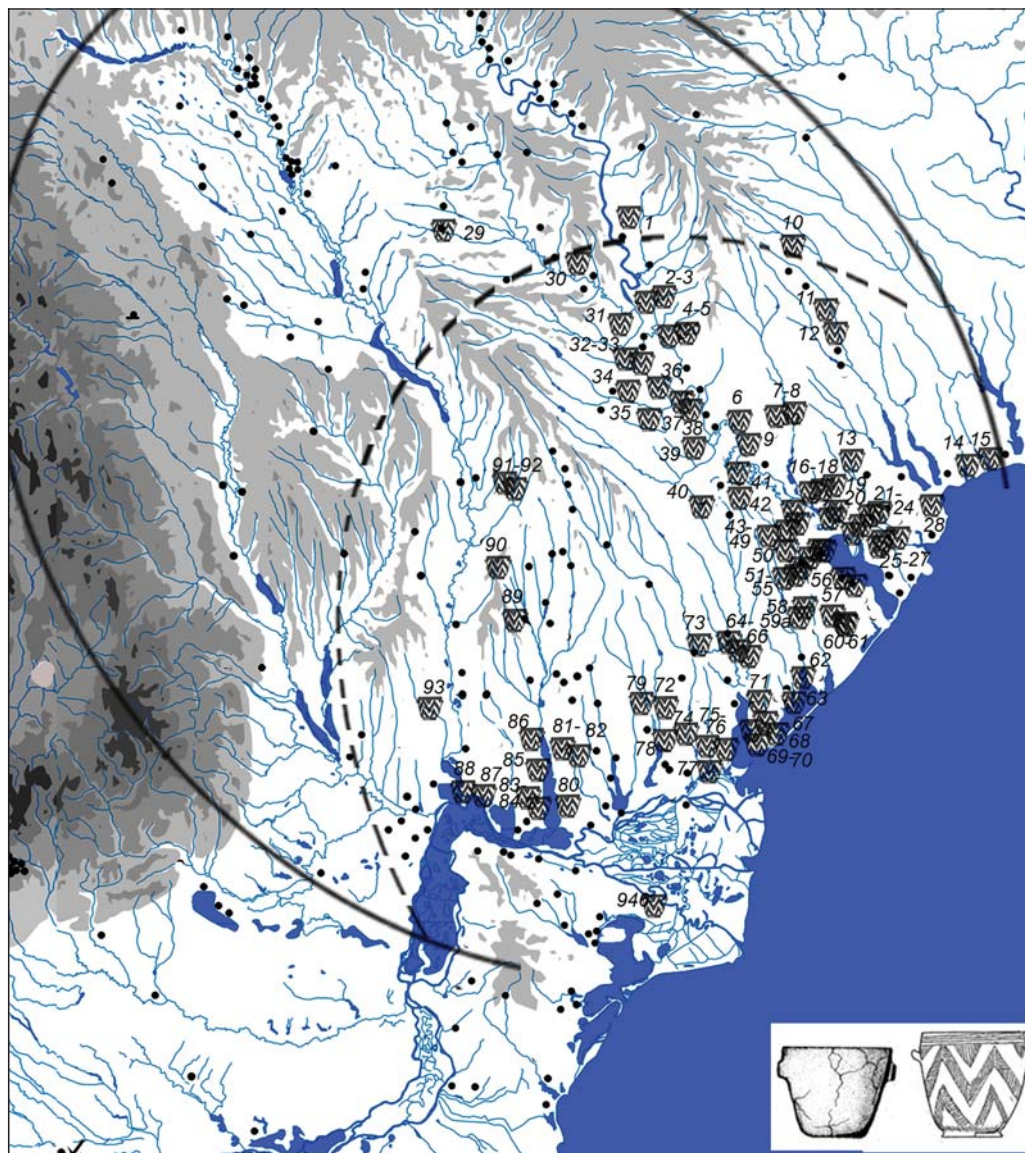


Fig. 3. Location of the Budzak type vessels (Budzhak type sites area is marked by dotted line) in comparison to Yamnaya culture sites area in Carpathians-Dniester region (solid line). Numbering corresponds to the number of Annex I: 1. Mocra 1/3, 2–3. Dubăsarii Noi 4/4, 31/7, 4–5. Crasnoe 9/23, 6. Tiraspol area, 7–8. Nicolscoe 7/45, 10/4, 9. Slobozia 1/25, 10. Grigorevka 1/12, 11. Revova 3/7, 12. Velikozimenovo 1/2, 13. Shcherbanka 1/10, 14. Starye Bilyary 1/14, 15. Vapnyarka 4/16, 16–18. Yasski 2/5, 3/6, 6/14, 19–20. Belyaevka 1/20, 2/10, 21–24. Mayaki III, 2/7, IV, 1/1, 3/1, 9/1, 25–27. Efimovka 2/14, 3/5, 6/6, 28. Novaya Dolina 1/2, 29. Grigorăuca 1/8, 30. Brăviceni 16/9, 31. Dubăsarii Vechi 1/28, 32–33. Corjovo 1/4, 2/13, 34. Chirca 1/7, 35. Beriozchi, destroyed grave, 36. Roșcani 1/13, 37–38. Gura Bicului 3/2, 5/13, 39. Ursoaia 3/12, 40. Cîrnățeni 6/9, 41. Talmază 3/15, 42. Ciobruți 4/10, 43. Răscăeții Noi 2/12, 44. Popeasca 1/9, 45. Purcari 1/23, 46–49. Olănești 1/26, 1/26; 6/4, 13/2, 50. Căplani 1/15, 51–55. Semenovka 2/2, 8/18, 12/2, 14/21, 19/4, 56–57. Sadovoe 1/14, 1/18, 58–59a. Polevoe 1/5, 1/8, 2/6, 60–61. Shirokoe 5/3, 5/6, 62. Diviziya 2 6/3, 63. Zheltyy Yar 3/12, 64–66. Zarya Mikhailovka 3/6, 3/8, 3/12, 67–68. Trapovka 1/8, 1/8, 69–70. Vishnevoe 17/31, 17/36, 71. Novoselitsa 19/19, 72. Bashtanovka 4/25, 73. Glubokoe 1/25, 74. Strumok 5/6, 75–76. Nerushay 9/56, 9/74, 77. Primorskoe 1/34, 78. Chervonny Yar I 1/2, 79. Kholmokoe 1/4, 80. Kislița 8/16, 81–82. Novokamenka 1/5, 1/mound, 83–84. Plavni 9/12, 15/5, 85. Nagornoe 14/15, 86. Frikatsey 10/14, 87. Etulia II, 1/6, 88. Giurgiulești 2/14, 89. Balabanu 13/10, 90. Svetlii 3/10, 91–92. Sărățeni 3/13, 6/4, 93. Vlădești T.216 1/2, 94. Murighiol 4/6 (number of the kurgan/number of the grave)



Fig. 4. Budzhak type vessels in context (1–18. left side, 19–32. right side, 33–34. on the back with the legs raised at the knees, 35–36. dismembered). 1. Dubăsari 4/4, 2. Crasnoe 9/23, 3. Nicolscoe 10/4, 4. Glubokoe 1/25, 5. Ursoaia 3/12, 6. Sărăteni 6/4, 7. Sadovoe 1/18, 8. Semenovka 8/18, 9. Diviziya 2, 6/3, 10. Velikozimenovo 1/2, 11. Efimovka 2/14, 12. Gura Bicului 5/13, 13. Grigorevka 1/12, 14. Semenovka 2/2, 15. Shirokoe 5/6, 16. Nagornoe 14/15, 17. Vlădești 1/2, 18. Primorskoe 1/34, 19. Efimovka 6/6, 20. Mayaki III 3/1, 21. Mayaki IV 1/1, 22. Vapnyarka 4/16, 23. Purcari 1/23, 24. Plavni 15/5, 25. Ciobruciu 4/10, 26. Corjevo 8/4, 27. Olănești 6/14, 28. Sărăteni 3/13, 29. Popiasca 1/9, 30. Kislitsa 8/16, 31. Slobozia 1/25, 32. Răscăeții Noi 2/12, 33. Mayaki III 2/7, 34. Novoselitsa 19/19, 35. Nicolscoe 7/45, 36. Trapovka 1/8 (number of the kurgan/number of the grave) (See Annex I)

For the moment, data from 94 complexes is available. For illustrative purposes, a series composed of half-known cases and reflecting all known variations is provided (*Fig. 4¹; Annex I*).

With three exceptions, the analysed vessels were found near individuals laid on the back, with an inclination on the right or left side. The distribution is as follows. 51 cases (61.4%) represent burials on the left side (*Fig. 4.1–18; Annex I*), out of which only two burials were in significantly crouched position (Yasski 2/5 and Primorskoe 1/34 – *Fig. 4.18*). 30 cases (36.1%) represent burials on the right side (*Fig. 4.19–32; Annex I*), out of which two burials were in a significantly crouched position (Slobodzeia 1/25 and Răscăieții Noi 2/12 – *Fig. 4.31–32*).

Exceptions include two burials (2.4%), in which vessels were found near burials in supine position with the arms along the body and, probably, legs raised at the knees and fallen to the left (*Fig. 4.33–34*). Four other examples represent disarticulated bodies (*Fig. 4.35–36*).

Therefore, Budzhak type vessels (with a few exceptions) are typical for the burials with individuals laid on the back, with an inclination on the left or right side. It is important to admit that both variations of the position are distributed in nearly equal proportion (51 and 30). Their orientation is also similar, representing northern (310° to 75°) and southeastern direction (135° to 285°) (*Fig. 5*).

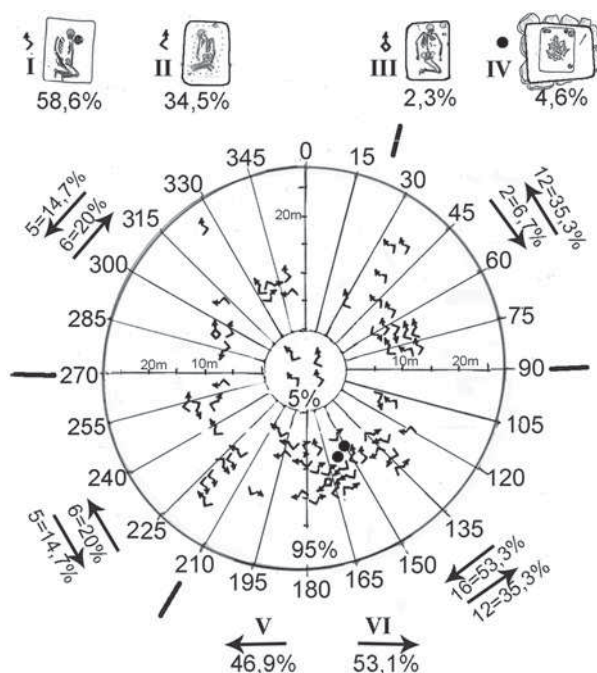


Fig. 5. Diagnostic characteristics of burials with Budzhak type vessels. Burial positions: I. left side, II. right side, III. on the back with the legs raised at the knees, IV. disarticulated. Main burials (in the centre) – 5%, secondary burials, peripheral in a mound – 95%. Orientation: V – clockwise, VI – counterclock-wise

This correlation identifies that the steppe zone differs from Yamnaya culture in the Carpathian-Dniester region not only by specific ceramics (Budzhak type vessels), but also specific funeral rites (individuals laid on the back, with an inclination on the right or left side). Then, what stands behind supine burials with legs raised at the knees, which are known in both steppe and forest-steppe zones? Do they represent the other culture? The answer brings us to the already expressed assumption/conclusion

¹ One should take into account that this figure groups burials on the left side and right side also considering their orientation to the north or southeast.

considering the chronological difference between the two burial types representing two periods of the same culture, at least in the Budzhak area. This conclusion contradicts S. V. Ivanova's interpretations and leaves them ungrounded.

Following the logic of spatial-chronological analysis, chronological sequences could be approached through the position of at least one unit (earliest or latest). This automatically leads to the identification of the second unit's chronology.

Considering the specifics of the dataset, we will address the materials of steppe, Budzhak groups. There are enough arguments in respect to its belonging to the late horizon of Yamnaya culture not only in the steppe but in the overall Carpathian-Dniester region.

The books dealing with a detailed classification of Yamnaya culture burial rites (MERPERT 1974; YAROVY 1985; DERGACHEV 1986) demonstrate that the burial rite including the supine position on the back with legs raised at the knees originated in the east. Its appearance in the Carpathian-Dniester region and spread in steppe and forest-steppe zones was related to the migration of people sharing the tradition. Since the Budzhak group demonstrates the predominance of burials with individuals laid on the back, with an inclination on the right or left side, 1) this funeral rite is later than the one representing supine burials with the legs raised at the knees, and 2) Budzhak complexes are later than the other complexes in the steppe and forest-steppe zone.

Another key argument. Burials with crouched skeletons, with rare exceptions, are not represented by the primary burials and, as a rule, are sunk into the mounds with the main burials laid on their backs. If these mounds do contain the main burials crouched on their sides, they do not provide secondary burials crouched on the back (of course, with rare exceptions) or do not contain any secondary burials at all.

Among barrows with burials including Budzhak type vessels (*Annex I*), only in four kurgans burials with such pottery are the main graves. In all other cases, these burials are secondary. Some specifics of these features should also be considered.

Barrow 1 near Grigorivka village (*Fig. 6.A*), in which the main burial was crouched on the side and contained a Budzhak type vessel, also included six secondary graves referred to Yamnaya culture (their location followed a circle). The position of the buried individuals was the same in all cases. Three barrows of the Mayaki IV cemetery (*Fig. 6.B–D*), in which main burials included Budzhak type vessels, did not have any secondary graves belonging to the Yamnaya culture, suggesting their short-term usage.

The planigraphy of barrows composed of three to four mounds, including 20–30 and sometimes even more graves belonging to different cultures, can be used as an additional argument towards the later chronological position of Budzhak complexes.

As widely known, Yamnaya and Catacomb culture populations practiced barrow erecting but also buried their deceased in secondary graves. The secondary graves were sometimes located in the central part of barrows, but more often they are located at the edges following a certain principle, mainly following a circle. The distance from the centre to such a circle depends on the barrow size. Therefore, the location of burials according to a principle reflects their sequence, somehow reminding tree rings, but with the extended time difference.

The four examples presented below are chosen using the following criteria (*Fig. 7*)²: 1) long-time used barrows including several mounds, and 2) supine burial on the back and (highly probable) legs raised at the knees, and also burials of the Budzhak type, i.e. laid on the back, with an inclination on the right or left side and correlated by the analysed vessel type or other materials discussed below (pendants, bone arrowheads, flint axes, etc.).

² Barrow's plans represent only the analysed burials; earlier Usatovo and Yamnaya graves (supine with legs raised at the knees) and chronological unidentified cenotaphs are marked by thin contours; probable Budzhak burials are marked by solid lines, and Catacomb graves are marked by thin lines with grey infilling.

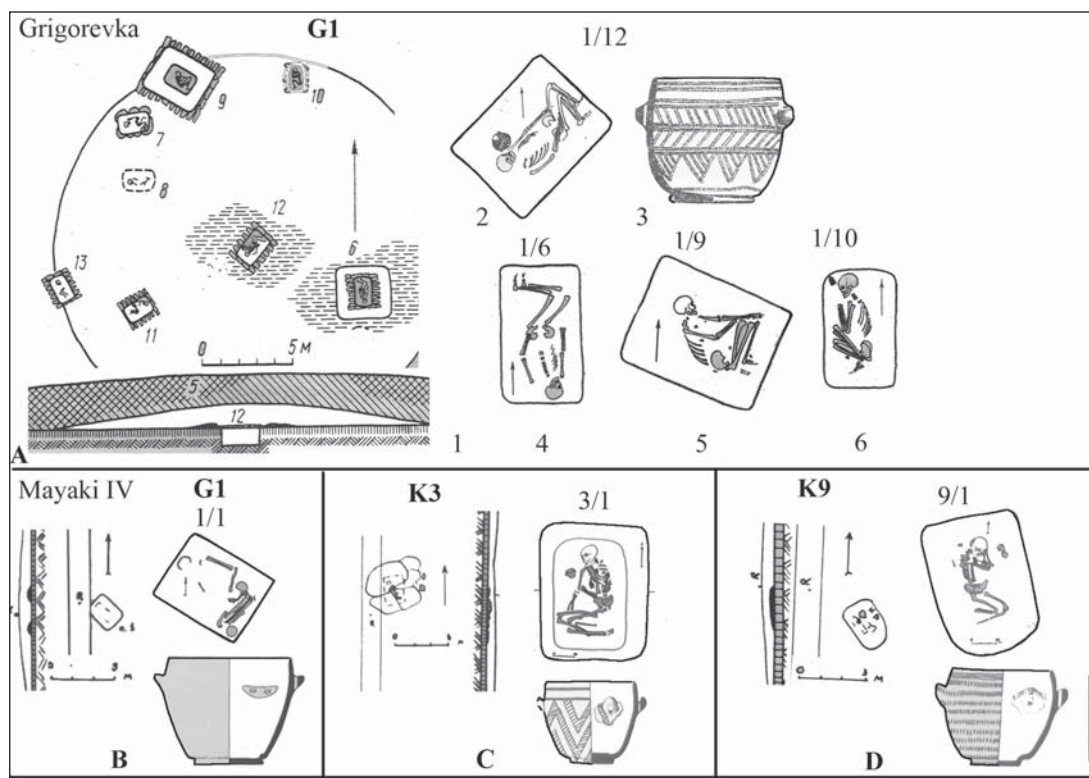


Fig. 6. Kurgans with main (central) burials including Budzhak type vessels.
(after: A. SUBBOTIN 1982; B–D. CHERNYAKOV et al. 1982; 1983)

Barrow 7 near the village of Nicolscoe (Fig. 7.A). Its main grave (42) belongs to the Yamnaya culture, the individual being laid supine with raised knees. The barrow has four secondary graves (25, 28, 44 and 47) and four graves of the Budzhak type (7, 43, 45–46), out of which one includes the Budzhak type vessel (Fig. 7.A/2–6). The four graves are located in the first mound, the other four are located outside of it (Fig. 7.A/1). Therefore, the latter four referred to the Budzhak type are later than the former four, characterised by the supine position with the legs raised at the knees.

Barrow 1 near the village of Glubokoe (Fig. 7.B). Usatovo type burial 16 is the main grave. The barrow includes 17 Yamnaya graves, out of which six are characterised by the supine position with the legs raised in the knees (5, 7, 9, 14, 21, 26), seven (11–13, 22–25) belong to the Budzhak type, and the other four are cenotaphs or typologically undistinguishable (6, 15, 19–20). Three burials of the first group characterised by the supine position are located inside the Usatovo stone construction (5, 9, 14), while three others are located to the east, in close relation to this stone construction. Among the secondary Budzhak type burials only one (22) is located in the perimeter of the stone construction, four graves are located in the western part of the barrow following the circle principle (12, 13, 23–24), and two more burials are spatially distinct (11, 25). The planigraphy of these burials suggests that the barrow included at least two additional mounds and the initial mound with stone construction. These mounds are represented in the profile section, but not on the barrow's plan.

The closest to the centre mound included three supine burials (7, 21, and 26) and one Budzhak type burial (13). The peripheral mound included one supine burial (6) and five Budzhak type graves (11, 12, 23–25) (Fig. 7.B/1). It is important to underline that the former group includes a burial with the typical Budzhak type vessel and copper bracelet discussed below (Fig. 7.B/2–11). Considering the peripheral

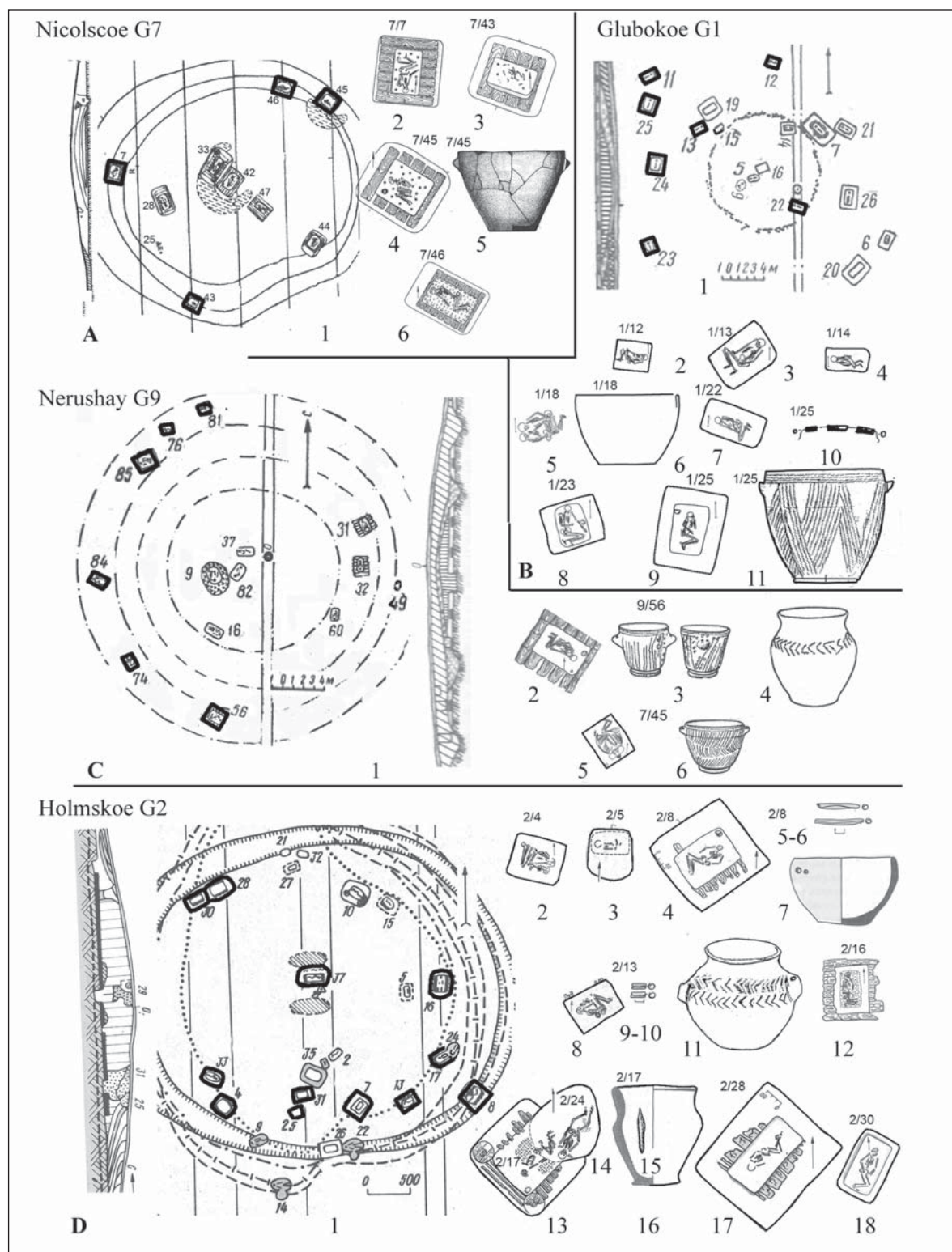


Fig. 7. Examples of different Yamnaya culture burial plans (A–C) compared to Catacomb graves plans (D).

Kurgan plans include only the analysed burials: the earliest Usatovo and/or Yamnaya burials with the legs raised at the knees and chronologically 20 unidentified cenotaphs are marked by thin lines, presumably Budzhak burials are marked by solid lines, Catacomb burials are marked by thin lines filled by grey (after: A. AGULNIKOV – SAVA 2004; B–C. SHMAGLIY – CHERNYAKOV 1970; D. CHERNYAKOV – STANKO – GUDKOVA 1986)

location of Budzhak type graves compared to the location of supine burials with the legs raised at the knees, Budzhak type graves are later than the former group.

Barrow 9 near the village of Nerushay (Fig. 7.C). According to the field observations, this kurgan included four mounds, the earliest of which is related to the Usatovo grave (82). The kurgan included at least 12 Yamnaya burials, out of which six are supine with the legs raised at the knees (9, 16, 31–32, 37, 60) and the other six are laid on the back, with an inclination on the right or left side (including two graves with Budzhak type vessels: 56, 74, 76, 81, 84–85)³. Unfortunately, except for the graves with vessels, the other Budzhak type burials were not illustrated in the publication (Fig. 7.C/2–6). According to barrow's plan (Fig. 7.C/1), supine burials on the back with the legs raised at the knees are located in the first and the second mounds, while all the Budzhak type burials are located in the western semi-circle in the fourth mound. Therefore, the latter group of burials is later than the former.

Barrow 2 near the village of Kholmskoe is important for consideration because of the well-documented stratigraphy and representative sample of Yamnaya and Catacomb graves (Fig. 7.D). Unfortunately, the illustration of the main grave is not available. According to the field report and description in publication (CHERNYAKOV – STANKO – GUDKOVA 1986, 80–81), the position is characterised as “supine... Legs with raised knees were fallen to the left”. However, from the description of the hand's location, “the right hand is flexed in a cubit, its wrist is placed to the right part of the body; the left hand is located along the body” we can easily reconstruct the typical Budzhak position, laid on the back, with an inclination on the left side. Therefore, all the other Yamnaya culture graves in this barrow are also referred to the Budzhak type. This is confirmed by burials' positions and inventory (vessels, copper beads, bone arrowhead) (Fig. 7.D/2–13, 15–18).

Comparison of Budzhak type and Catacomb culture graves, as it comes from the general plan (Fig. 7.D/1), indicates that the Catacomb graves were of the secondary character located in the same mound in the southern periphery of the barrow as Budzhak type burials. This indicates their chronological similarity, if not partial synchronicity. This statement is confirmed by the stratigraphy of the Yamnaya culture grave 17 disturbed by the Catacomb grave 24. “Burial 24... partly disturbed it [burial 17 – V.D.], being placed slightly above its bottom. During the burial process in grave 24, the wooden overlay of grave 17 was not rotted yet, and the grave was not filled by soil. This made possible the usage of empty space for placing the new burial 24. Wooden constructions of the overlay of grave 17 collapsed later and were fallen on the skeleton in grave 24” (CHERNYAKOV – STANKO – GUDKOVA 1986, 77). Therefore, without any doubt, there is a co-habitation between Late Yamnaya and Early Catacomb populations. In its turn, this confirms the hypothesis on the later chronological position of Budzhak type burials compared to Yamnaya complexes with the supine position.

Two other cases documenting the partial synchronicity of Budzhak and Catacomb populations are as follows. The secondary grave 31 in the barrow 17 near the village of Vishnevoe in a “Classical” catacomb includes burial in the Budzhak position accompanied by the typical Budzhak vessel (Fig. 8.1). In grave 10 of barrow 2 near the village of Belyaevka in a non-typical catacomb (considering the construction techniques), the entrance pit and the grave included fragments of the same vessel of Budzhak type (Fig. 8.2).

The chronological position of Budzhak burials is indirectly confirmed by two vessels found in burials with deceased crouched on a side position in the barrows located in the Lower Southern Bug region (Fig. 8.3–4). According to O.G. Shaposhnikova's scheme, this burial rite is typical for the two latest (III and IV) groups of Southern Bug variation of Yamnaya culture (SHAPOSHNIKOVA *et al.* 1986, 51).

Summarising the observations considering the spatial and stratigraphic position of burials including Budzhak type vessels, these complexes are later than Yamnaya burials in supine position with the legs

³ Cultural attribution of the grave 49 with sharp-shaped bottom ornamented by teeth-shaped stamp remains an issue.



Fig. 8. Catacomb culture complexes (1–2) from the Budzhak steppe and Late Yamnaya culture of the Southern Bug region (3–4) with Budzhak type vessels: 1. Vishnevoe 17/31, 2. Belyaevka 2/10, 3. Kovalevka VIII 1/10, 4. Korchino 1/10 (after: 1. DVORYANINOV – DZIGOVSKIY – SUBBOTIN 1985; 2. PETRENKO 2007; 3. SHAPOSHNIKOVA – FOMENKO – DOVZHENKO 1986; 4. KOVPANENKO – GAVRILIUK 2004)

raised at the knees and represent a distinct variation of Yamnaya culture in the steppe zone between the Carpathians and the Dniester.

To verify this hypothesis, let us analyse ornaments. More specifically, let us consider spiral-shaped temple rings and bracelets (Fig. 9.A–B) being the most widely spread ornaments of Yamnaya culture in the analysed region.

Spiral-shaped rings. According to their form, rings are subdivided into two types: rings with one–two or four–five loops (Fig. 9.A/1–8), and bagel-shaped rings in a form of a non-joint circle, somewhat

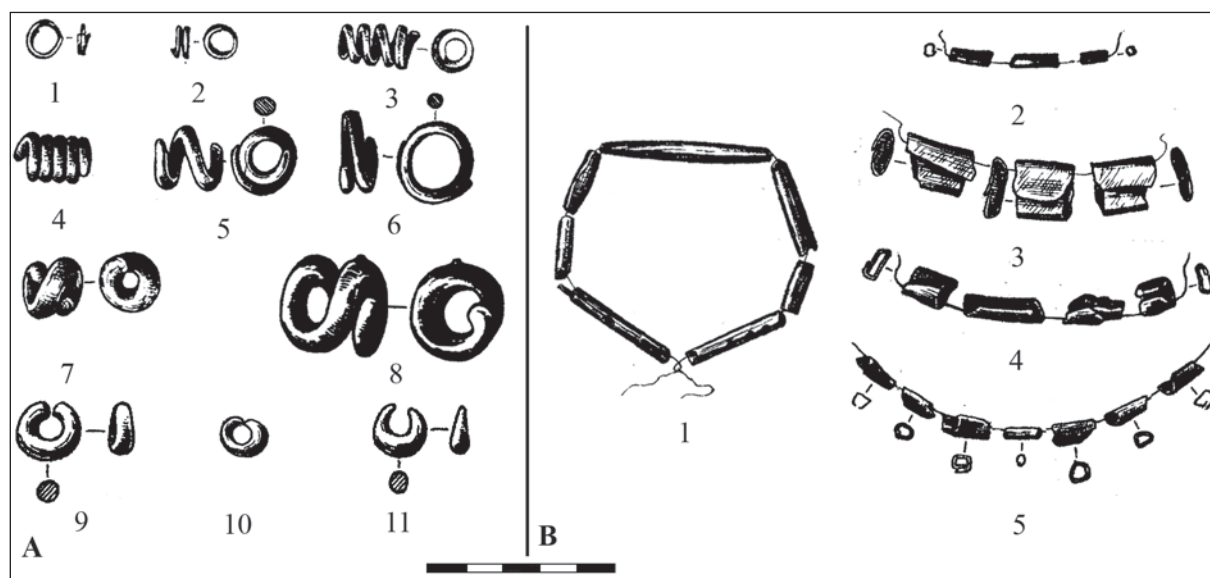


Fig. 9. A. spiral-shaped temple rings: 1. Olănești 1/16, 2. Plavni 26/7, 3. Dobroaleksandrovka 1/5, 4. Ciobruciu 1/11, 5. Giurgiulești 1/9, 6. Trapovka 1/9, 7. Shirokoe (Alkalia) 33/3, 8. Taraclia 2, 10/10, bagel-shaped: 9. Roșcani 1/19, 10. Orhei 1/2, 11. Brăviceni 2/7 (1, 3, 5, 7–11. silver; 2. gold, 4, 6. copper?) (See Annex II). B. composed bracelets: 1. Liman 3A/30, 2. Glubokoe 1/24, 3. Alkalia 33/3, 4. Roșcani 1/13, 5. Borisovka 9/6 (copper?) (See Annex III)

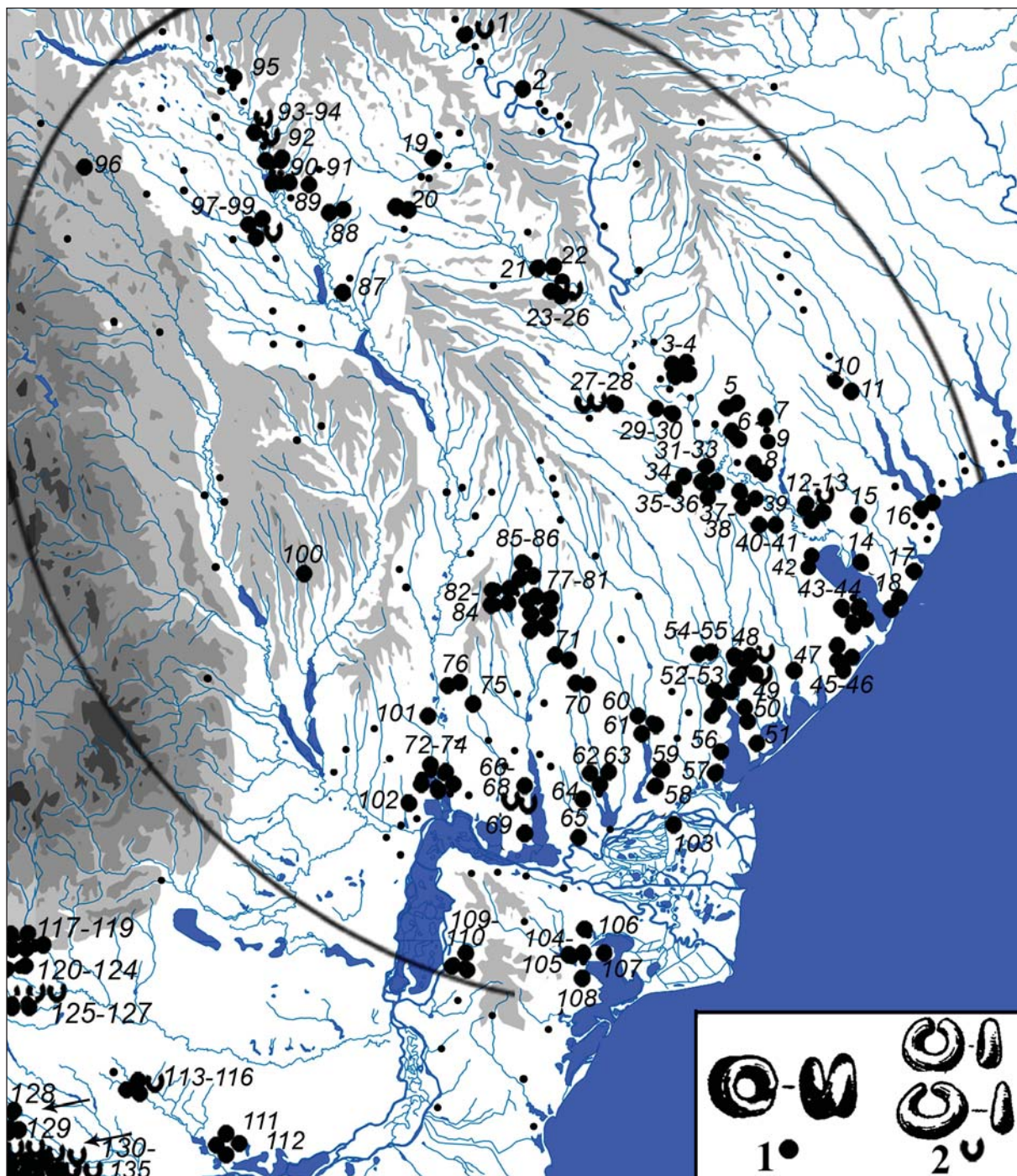


Fig. 10. Yamnaya culture complexes with spiral-shaped rings from Carpathians – Dniester region (the numbering corresponds to the number of complexes and the number of Annex II): 1. Pisarivka 5/1, 2. Cuzmin 3/2, 3–4. Crasnoe 2/5, 9/19, 5. Blizhniy Khutor 3/1, 6. Tiraspol II 3/18, 7. Nicolscoe 1/11, 8. Ciobrucci II 1/11, 9. Glinoe Sad 1/4, 10. Katarzhino 1/11, 11. Baranovo-Soldatskaya Slava 1/10, 12–13. Yasski 1/18, 5/22, 14. Efimovka 10/10, 15. Dobroaleksandrovka 1/5, 16. Odessa-Slobodka-Romanovka 1/15, 17. Sanzheyka 1/8, 18. Karolino-Bugaz 1/1, 19. Mărculești 3/10, 20. Bursuceni 1/12, 21. Brînzarii Noi 1/2, 22. Ciocîlteni 5/6, 23–26. Brăviceni 1/14, 2/8, 4/4, 7/2; 27–28. Orhei 1/2, 1/6, 29–30. Roșcani 1/19, 2/3, 31–33. Gura Bicului 3/13, 5/3, 7/1, 34. Hagimus 2/7, 35–36. Căușeni II 1/10, 1/13, 37–38. Talmaza I 1/6, 3/4, 39. Purcari 1/31, 40–41. Olănești 1/16, 6/8, 42. Semenovka 11/5, 43–44. Sadovoe 1/26, 1/32, 45–46. Shirokoe/Alkaliy 33/7, 33/9,

47. Diviziya II 5/8, 48. Belolese 7/4, 49–50. Novoselitsa 19/11, 21/1, 51. Trapovka 16/9, 52–53. Liman 3A/52, 7/3, 54–55. Glubokoe 1/7, 1/26, 56. Nerushay 1/14, 57. Primorskoe 1/32, 58. Parapory 1/20, 59. Shevchenkovo 3/6, 60–61. Kholmokoe 2/37, 8/6, 62–63. Ostrovnnoe 2/6, 2/7, 64. Utkonosovka 6/1, 65. Bogatoe 2/11, 66–68. Plavni 8/31, 25/1, 26/7, 69. Mrestnota Mogila 2/7, 70. Kurchi 20/16, 71. Ogorodnoe III 1/6, 72–74. Giurgiulești 2/9, 3/8, 5/5, 75. Găvănoasa 4/3, 76. Crihana Veche 9/17, 77–81. Taraclia II 3/7, 10/10, 10/19, 14/3, 18/10, 82–84. Balabanu I 13/12, 13/15, Balabanu II, 2/1, 85–86. Cazacalia 17/3, 23/10, 87. Petrești II 1/8, 88. Iablona 1/17, 89. Duruitoarea Nouă 5/5, 90–91. Cuconești Vechi-Dumeni 9/21, 12/4, 92. Corpaci 8/12, 93–94. Bădragii Vechi 6/7, 25/12, 95. Tețcani II 1/10, 96. Broșteni 1/1, 97–99. Glăvănești Vechi 1/10, 1/12, II/3, 100. Ivănești, 101. Vlădești 243/2, 102. Vânători 222/13, 103. Chilia Veche 1/89, 104–105. Mihai Bravu 1/3, 1/4, 106. Sabangia 3/2, 107. Zebil-Movila Sărată, 108. Enisala, 109–110. Rahman 1/2, 2/3, 111–112. Sultana-Movila mare 1/1, 1/5, 113–116. Gurbănești 1/2, 2/7, 2/9, 2/12, 117–119. Blejoi III/1, III/3, IV/1, 120–124. Aricești-Rahtivan I/1, I/3, IV/4A, IV/5B, VII/2, 125–127. Ploiești-Triaj I/3, II/15, II/20, 128. Verbița 2/?, 129. Plenița Măgura Mare/1, 130–135. Zimnicea – flat cemetery, burials: 4, 9, 11, 16, 20, 24 (number of the kurgan/number of the grave)

thickened in the middle part, also known as crescent rings (*Fig. 9.A/9–11*). The first type quantitatively dominates; such rings are usually of silver, rarely they are made of copper or gold. The diameter varies from 0.5 to 1.2–2 cm with the diameter of wire reaching from 1 to 3–4 mm. Crescent rings are found rarely. They were mainly made of silver. The diameter is about 1 cm.

Incomplete data on the occurrence of these pendants in the Carpathian-Dniester region are available in the paper by L.V. SUBBOTIN (2003, 34), and for the territory of Romania in the papers by A. Frînculeasa and colleagues (FRÎNCULEASA *et al.* 2019, Annex II). Generally, we have registered 135 burials with temple pendants for the Carpathian-Dniester region and Wallachia. Each of them contains one, more often two, and sometimes three or five pendants, respectively, their total number is slightly more than 200, 197 of which are spiral-shaped, and 21 are bagel-shaped or ring-shaped with open ends and non-joint circles (*Annex II*).

As a rule, such rings are found near the temple bone, while they are most typical for children's graves, but also known for male and female burials.

Let us discuss geography and context. As represented in *Figure 10*, finds of this category are distributed across the overall area of Yamnaya culture between the Carpathians and the Dniester. Concentrations are visible in the steppe zone along the Black Sea coast, in the Lower and Middle Dniester and Prut, and partly in the Lower Danube region. In other words, we discuss the territory of Yamnaya culture sites distribution (*Fig. 10*: small dots).

What is it about their context? It is reflected in two figures, which include 45 complexes (out of 115), which have identified positions of burials and include temple rings (*Figs. 11 and 12*).

First of all, temple rings are rarely associated with the other kinds of burial inventory. The sample (45 graves) is represented by six–seven vessels (*Fig. 11.4, 14, 20–21; Fig. 12.1, 11, 16*, four–five tools, weapon or ornaments (*Fig. 11.15, 20; Fig. 12.13*). Two cases are the wheels from wooden wagons (*Fig. 11.21–22*).

However, the most important is the correlation between rings types and funeral rites. The Carpathian-Dniester region is characterised by the following statistics: in 76 cases (66.1%) rings accompanied supine with legs raised at the knees (*Fig. 11.1–22; Fig. 12.2–3, 5, 12*), in 25 cases (21.7%) they were found in graves with individuals laid on the back, with an inclination on the right side or significantly crouched position (*Fig. 11.23–27*), and in 14 cases (12.2%) they accompanied individuals laid on the back, with an inclination on the left side (*Fig. 11.28–30; Fig. 12.8*). Therefore, the temple rings demonstrate the opposite trend to the Budzhak type vessels (*Fig. 15.1, 3*). If the latter mainly correlates with individuals laid on the back, with an inclination on the left/right side or crouched (97.5%) and only a few (2.5%) –



Fig. 11. Spiral-shaped temple rings in context (1–22. supine position with raised legs, 23–30. right and left-side): 1. Pisarivka 5/1, 2. Cuzmin 3/2, 3–4. Bădragii Vechi 6/7, 25/12, 5. Corpaci 8/12, 6. Duruitoarea Nouă 5/5, 7. Petrești 1/8, 8. Iablona 1/17, 9. Mărculești 3/10, 10. Brăviceni 7/2, 11. Crasnoe 2/5, 12. Tiraspol II 3/18, 13. Balabanu II 2/1, 14. Ciobruciu II 1/11, 15. Baranovo «Soldatskaya Slava» 1/10, 16. Sadovoe 1/26, 17. Novoselitsa 19/11, 18. Parapory 1/20, 19. Nerushay 1/14, 20–21. Taraclia II 10/19, 18/10, 22. Giurgiulești 2/9, 23. Talmaza 3/4, 24. Orhei 1/2, 25. Taraclia 2 3/7, 26. Liman 7/3, 27. Nicolscoe 1/11, 28. Purcari 1/31, 29. Brăviceni 2/8, 30. Karolino-Bugaz 1/1 (number of the kurgan/number of the grave) (See Annex II)

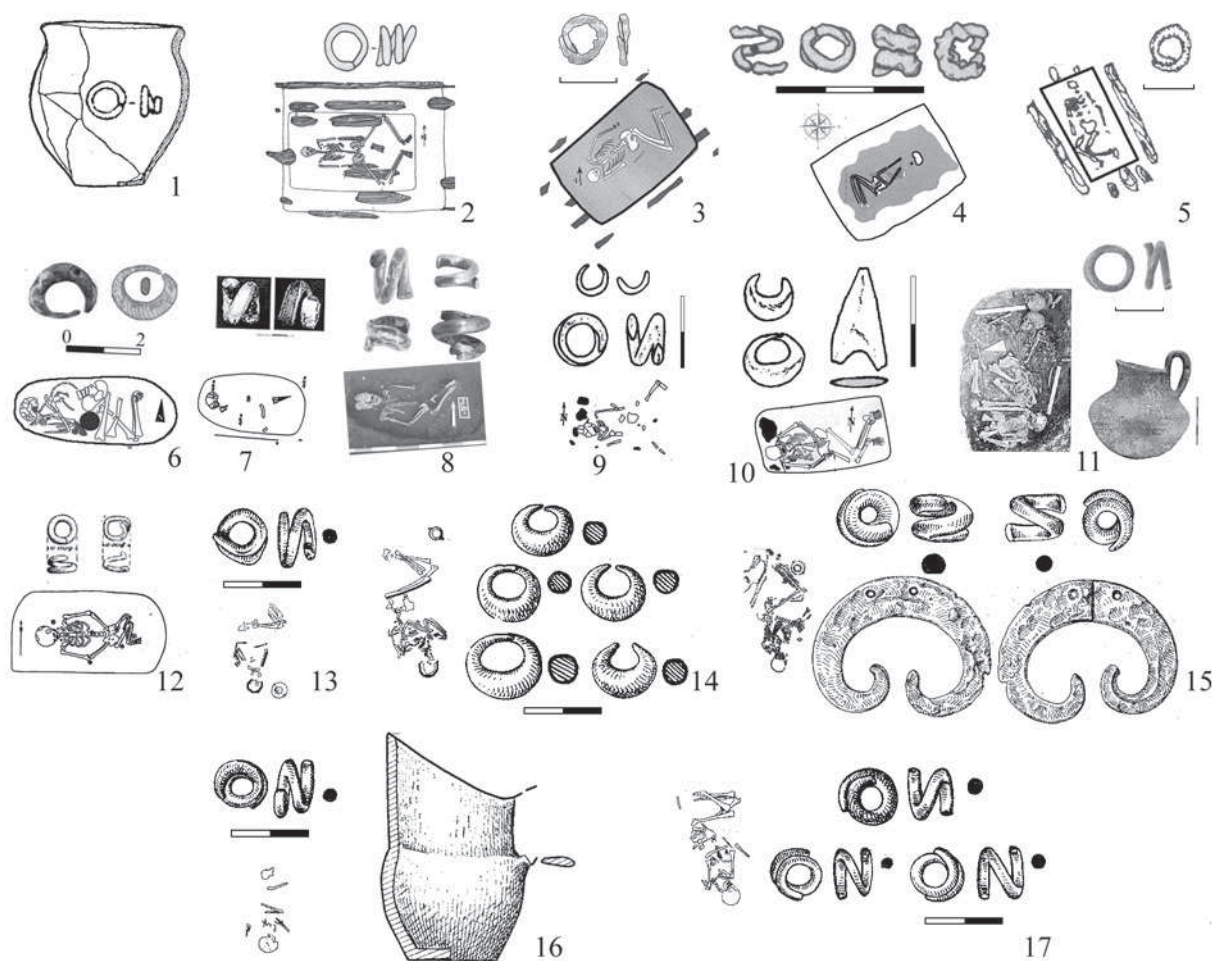


Fig. 12. Spiral-shaped temple rings in context, Romanian sites (2–3, 5, 7, 9–10, 12. supine position with raised legs, 4, 6, 8, 11, 13–17. right and left-side): 1. Broșteni 1/1, 2. Vânători 222/13, 3–4. Rahman 1/2, 2/3, 5. Sabangia 3/1, 6. Smeeni 1/7, 7–8. Blejoi III/1, IV/1, 9–11. Ariceștii-Rahtivan I 1/1, 1/3, 4/5, 12. Plenița-Măgura Mare/1; 13–17. Zimnicea, flat cemetery, graves: 4, 9, 11, 16, 20 (See Annex II)

with those buried crouched on their backs with raised knees, in the case of temple pendants, 66.1% of them fall on supine burials with legs raised at the knees, and only 33.9% on those buried crouched on the left or right sides.

Composed bracelets. These artefacts are characterised by a simple form of round-profile tubes or somewhat flattened staples, fabricated of copper plates. Artifacts of the first group, probably, were placed one after the other on a thread. Artifacts of the second group were joined by a thread. Their length varies from 0.5 to 5–6 cm with a diameter of 0.3–0.6 cm (Fig. 9.B/1–2, 4–5). In the case of flattened components, their dimensions in profile reach 0.2 to 0.5–1 cm (Fig. 9.B/3).

There are known 75 burials (Fig. 13.1–75) for the Carpathian-Dniester region, they contain from one to six to seven threads (166 threads in total). Many of them are reflected in the book by L.V. SUBBOTIN (2003, 33–34). Another seven burials with 9 tubes are known from the Romanian Dobroudja and the barrows of the Prahova group (Fig. 13.72–75; Annex III).

Unlike spiral-shaped rings, composed bracelets were being worn on wrists of both arms (18 – on the left arm, 16 – on the right one). They are likely associated with men, women and children's

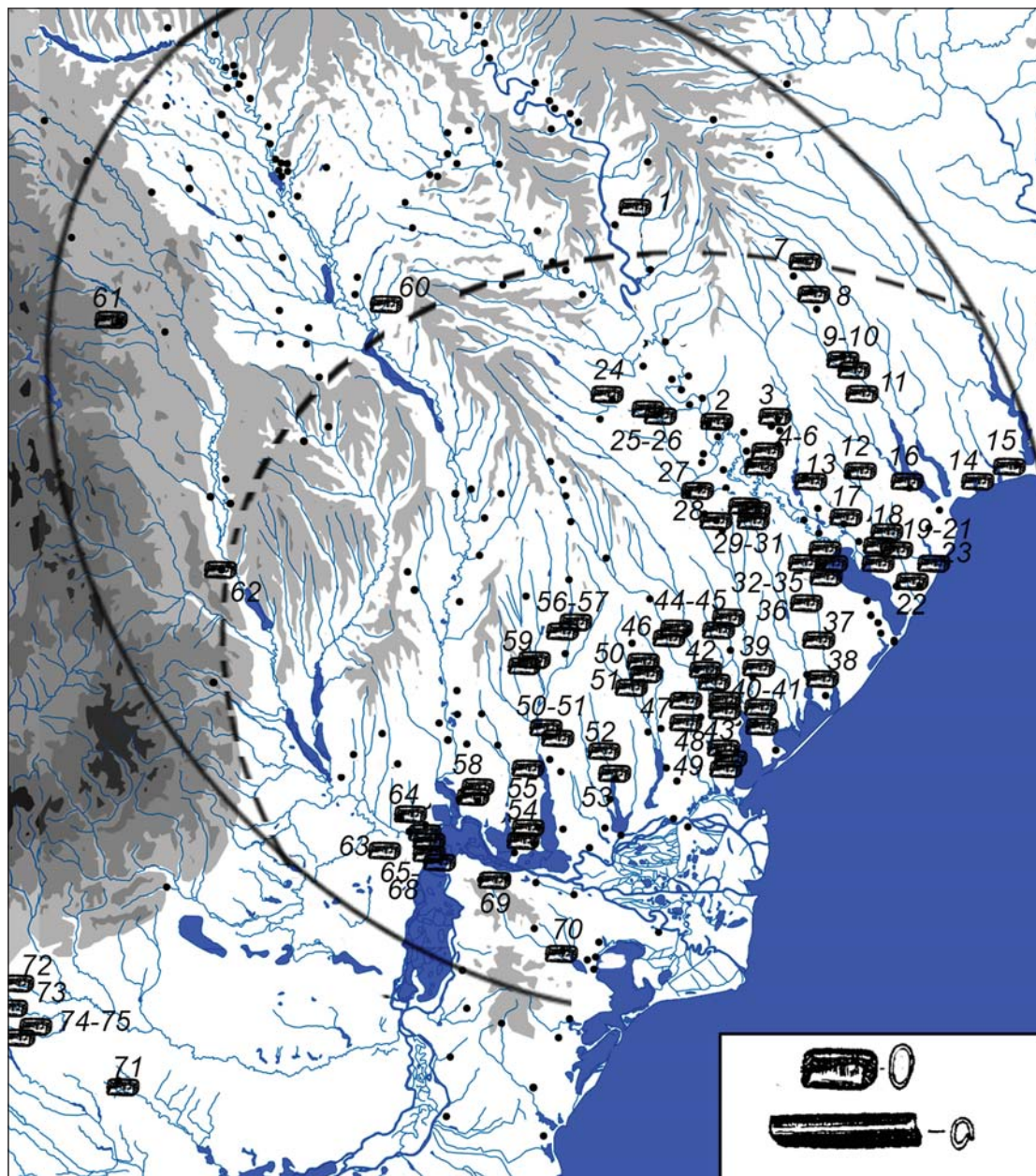


Fig. 13. Location of composed bracelets made of thin copper plates (locations numbering corresponds to the numbers of Annex III): 1. Mocra 1/6, 2. Târnauca II 2/17, 3. Nicolscoe 7/7, 4–6. Slobozia 1/21, 4/4, 4/5, 7. Grigorevka 1/12, 8. Novogrigorovka-Liubasha 2/2, 9–10. Katarzhino 1/1, 1/21, 11. Baranovo 1/9, 12. Shcherbanka 1/7, 13. Limanskoe 4/4, 14. Starye Biliary 1/14, 15. Vapnyarka 4/16, 16. Kholodnaya Balka 1/15, 17. Yasski 5/2, 18. Petrodolinskoe 1/9, 19–21. Nikolaevka/Efimovka 2/23, 6/3, 10/7, 22. Novogradovka 1/4, 23. Aleksandrovka 1/32A, 24. Mereni II 1/3, 25–26. Roşcani 1/13, 5/7, 27. Cîrnăţeni 2/10, 28. Ştefan Vodă II 1/7, 29–31. Slobozia I 1/15; II 4/4, 4/5, 32–35. Semenovka 2/2, 8/15, 8/16, 19/9, 36. Podgorodnoe/Krestovaya mogila 1/19, 37. Shirokoe/Alkalia 33/3, 38. Diviziya II 6/1, 39. Belolese 11/9, 40–41. Trapovka 1/11, 4/7, 42. Liman-Zakharkina mogila 3A/30, 43. Borisovka 9/6, 44–45. Glubokoe 1/24, 1/25, 46. Artsyz 1/22, 47. Bashtanovka 4/25, 48–49. Nerushay 10/13, 10/14, 50–51. Kholmskoe 2/8, 2/13, 52. Kamenka 1/8, 53. Novokamenka 1/5, 54. Orlovka 1/9, 55. Vlădiceni I, 9/2, 56–57. Kubey 22/18, 23/16, 58. Giurgiuleşti 3/13, 59. Taraclia II 14/16, 60. Petreşti 1/3, 61. Tîrpeşti/I, 62. Răcăciuni /?, 63. Râmnicelu /10, 64. Şendreni /?, 65–68. Brăileşti /3, /8, /9, /33; 69. Luncaviţa-Drumul Vacilor 1/5, 70. Mihai Bravu 2/3, 71. Gurbăneşti 1/2, 72. Blejoi I/1, 73. Păuleşti II/2, 74–75. Ploieşti-Triaj I/2, 1/3



Fig. 14. Copper beads in context (1–19. on the back with an inclination on the left side, 20–31. on the back with an inclination on the right side, 32–35. supine position with raised legs, 36–37. cenotaphs, 38. ritual complex, 39. unknown position): 1. Mocra 1/6, 2. Baranovo 1/9, 3. Roșcani 1/13, 4. Tîtnauca II 2/7, 5–8. Semenovka 2/2, 8/15, 8/16, 19/9, 9. Shirokoe/Alkalia 33/3, 10. Diviziya II 6/3, 11. Nerushay 10/13, 12. Belolese 4/4, 13. Kholmskoe 2/13, 14. Kamenka 1/8, 15. Novokamenka 1/5, 16. Bashtanovka 7/1, 17. Vlădiceni 9/2, 18. Aleksandrovka 1/24, 19. Starye Biliary 1/14, 20. Limanskoe 4/4, 21. Petrodolinskoe 1/9, 22. Kholmskoe 2/8, 23. Borisovka 9/6, 24. Roșcani 5/7, 25. Kubey 23/16, 26. Giurgiulești 3/13, 27. Taraclia II 14/16, 28–29. Brăilești 1/8–9, 30. Păulești 2/1, 31. Blejoi 1/1, 32. Slobozia I 1/15, 33. Trapovka 4/7, 34. Kubey 22/18, 35. Gurbănești 1/2, 36. Diviziya II 6/1, 37. Petrești 1/3, 38. Novogrigorevka-Liubasha 2/2, 39. Șendreni ?? (See Annex III)

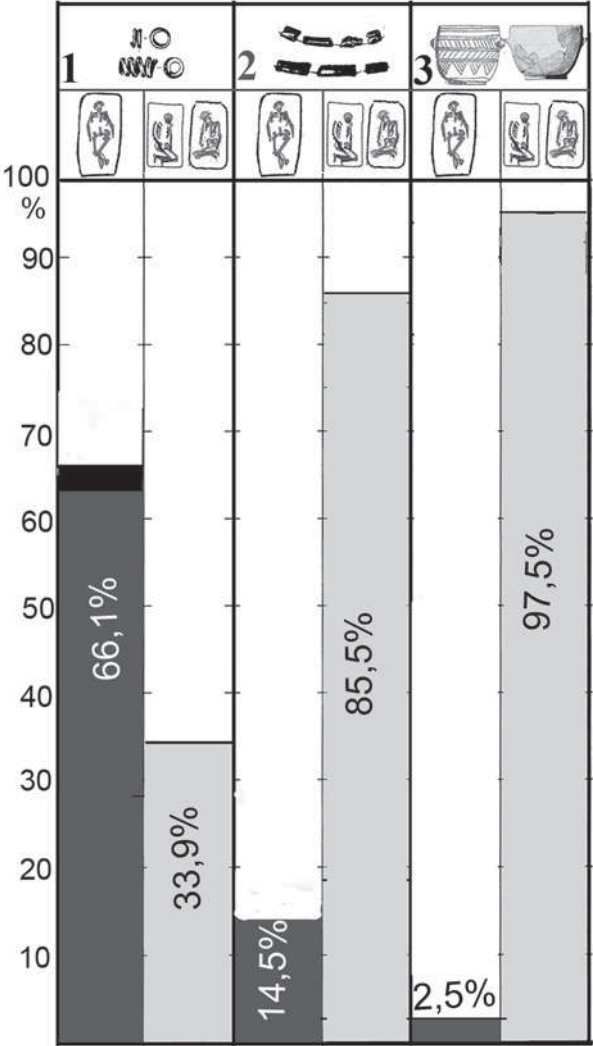


Fig. 15. Portions of burial rite types (positions) typical for the graves with temple rings (1), composed bracelets (2), and Budzhak type vessels (3)

graves. However, the latter statement requires verification because of the incomplete anthropological identifications. In rare cases, components of bracelets were found near a skull and hence might have been also used as temple rings or components of ornaments associated with the breast.

What about their spatial distribution? Unlike temple rings (Fig. 10), composed bracelets (with six–seven exceptions: Fig. 13.61, 71–75) were found in steppe burials. Their area corresponds to the territory of Budzhak type vessel finds (Fig. 3). Similarities between these categories of data also include correlations with other inventory and funeral rites.

Figure 14 demonstrates drawings of 39 (out of 75) complexes including copper beads and other inventory coming from burials with clearly identified positions. Comparing these data with the evidence on spiral-shaped rings, it is easy to recognise a significant difference in qualitative and quantitative characteristics of the assemblages. As mentioned above, complexes with rings include vessels in a very limited number, tools and weapons, and also parts of wagons (Fig. 11 and 12). Almost every second complex including copper beads is also accompanied by ceramics of various forms (Fig. 14). Moreover, Budzhak type vessels are among the most common pottery shapes (Fig. 14.3, 5, 10, 14). Weapons and

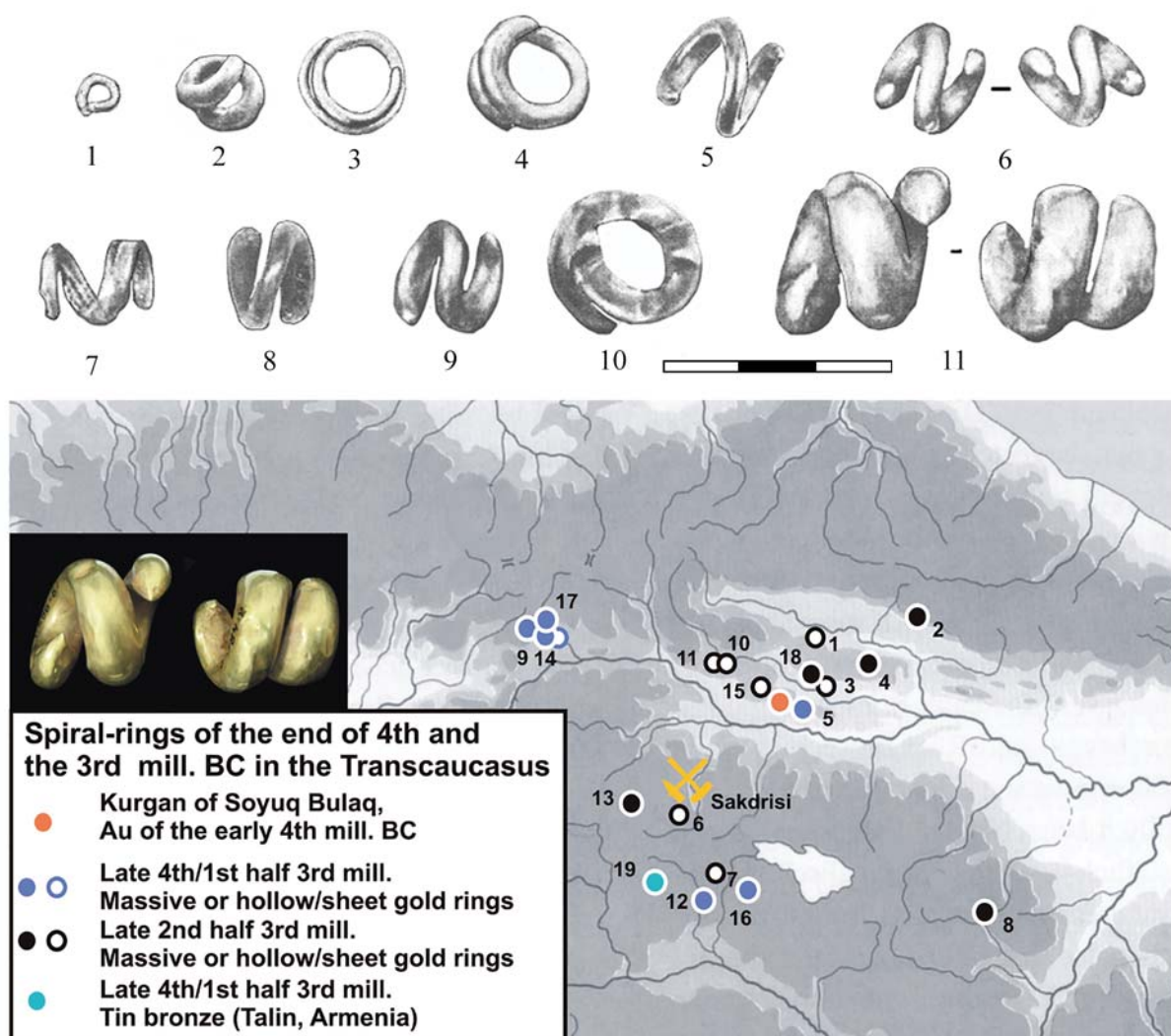


Fig. 16. Gold spiral-shaped rings of the 4th–3rd millennium BC from Kura and Arak interfluvium (after Stöllner 2016, 216, fig. 5.11)

tools are also found more commonly. In the context of this study flint axes-adzes and bone arrowheads require additional discussion (Fig. 14.3, 9).

Differences in funeral rites between the compared groups are visible. As stated above, Budzhak type vessels mostly accompany individuals laid on the back, with an inclination on the left/right side (Fig. 15.3). A similar distribution is also noted for features with copper beads: in 47 cases (85.5%) these finds are associated with individuals laid on the back, with an inclination on the left (28) or right (19) side, and only in 8 cases (14.5%) they were found in burials with a supine position with the legs raised at the knees (Fig. 15.2).

Correlations are different for the complexes with rings. As stated above, in 76 cases (66.1%) they accompany supine burials with the legs raised at the knees and only in 39 cases (33.9%) they were found with individuals laid on the back, with an inclination on the left/right side. This distribution is represented in Figure 15.

Therefore, we may conclude that burials including Budzhak type vessels and copper beads represent a group that is distinct from burials with temple rings. This difference may be explained only by their

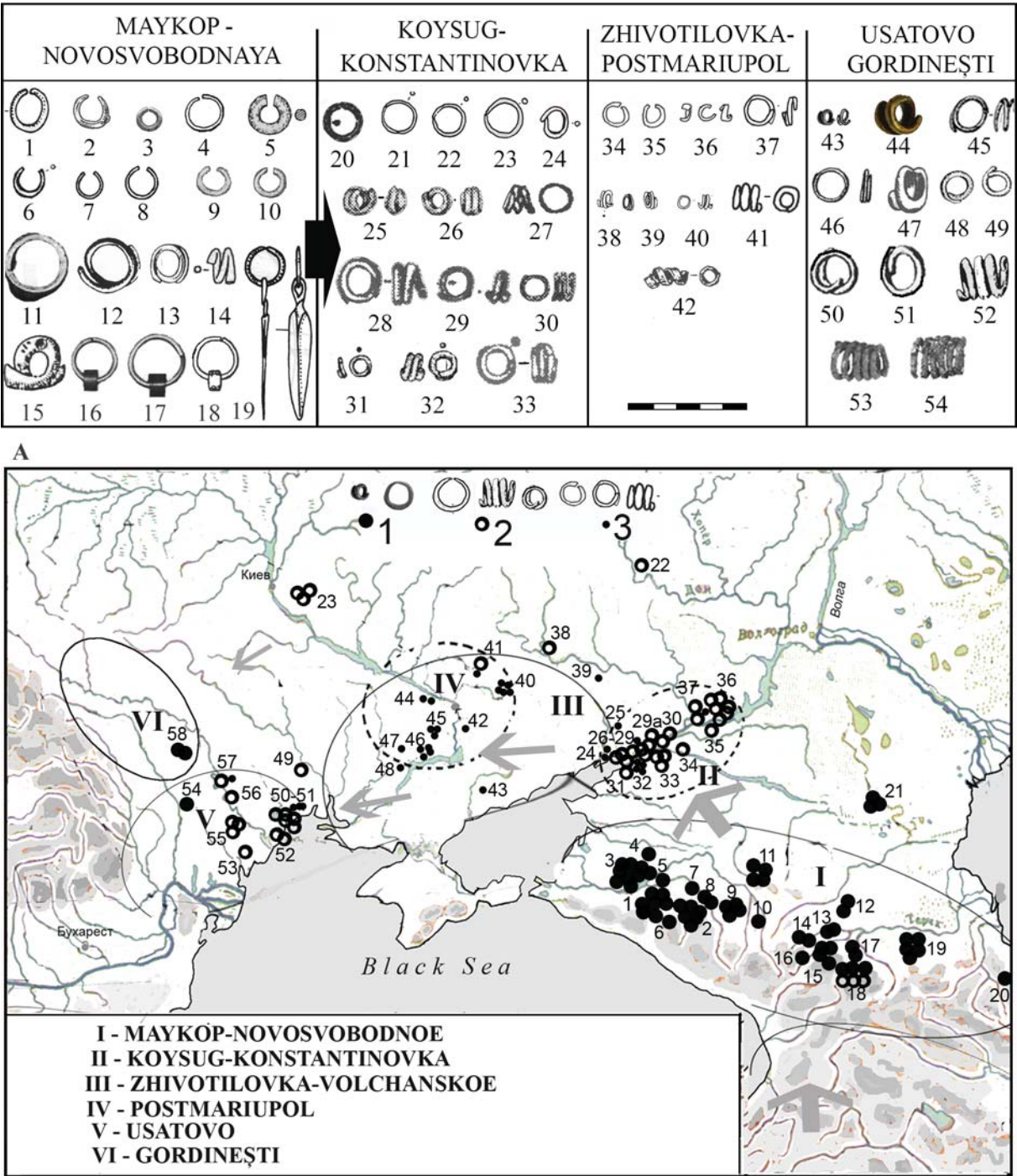


Fig. 17. A. Examples of the Maykop circle-shaped and spiral shaped rings from Caucasus (1–19) and western area (20–54): 1, 12, 19. Novosvobodnaya 1/30–31, 2. Khutor Zhukovskogo 1/; 3. Marinskaya 1/, 4, 18. Mostovskaya 3/, 5. Nalchik, 6. Kishpek 1/, 7–8. Chegem, 9–10. Bakhmut 8/, 11, 16–17. Maykop, 13. Kostromskaya 3/, 14. Velikent, 15. Bichkin-Buluk (after MUNCHAEV 1994; KORENEVSKIY 2004; 2011; REZEPKIN 2012 and others); 20. Rostov-na-Donu-Vertoletnoe Pole 1/?, 21–23. Kostyrskiy VIII ?/3, 24. Konstantinovsk ?/2-3, 25–26. Sadovyy ?/64, 27. Novoaleksandrovka I, 28–29. Lakedemonovka 1/, 30. Nedvigovka-Tanais, 31–32. Polyakov 1/, 33. Otradnyy 3/ (after RASSAMAKIN 2004; FAYFERT 2014 and others); 34–35. Chkalovka 3/?, 36. Osokorovka, 37. Terny 9/?, 38–39. Liubimovka 3/?, 40. Solnechnyy 2/?,

41. Novopilipovka, flat cemetery - Akkerman I, 42. Ordzonikidze-Chkalovskaya 3/ (after RASSAMAKIN 2004 and others); 43–44. Bursuceni, 45–46. Purcari 1–30 2/?, 47. Sucleia 3/?, 48–52. Usatovo, kurgan cemetery 1, 1/6, 13; kurgan cemetery 2, 2/?, 53–54. Aleksandrovka (after PATOKOVA 1979; YAROVY 1990; DERGACHEV 2002 and others); B. Location of the Maykop circle-shaped and spiral-shaped rings made of gold (1), silver (2) and copper/broze-? (3): 1. Maykop, 2. Novosvobodnaya 1-2/, - Klady 2/, 28/, 30–31/, 38/, 3. Staromyshastovskiy deposit, 4. Kamenka-Dneprovskaya 2/, 5. Krasnogvardeysk 1/7, 6. Psebayskaya 1/, 7. Kostromskaya 3/, 8. Andriukovskaya, 9. Mostovskaya 3/, 10. Kubinka 4/, 11. Khutor Zhukovskogo 1/, 12. Marinskaya 1/, 13. Kishpek III 6/, 14. Kyzburun III 1/, 15. Chegem I 1, 5/, 47/; II, 2/, 16. Nezhinskiy 5/, 17. Nalchik, 18. Kudakhurt 1/, 19. Bakhmut 14–15/, 20. Velikent, 21. Bichkin-Buluk, 22. Pavlovskoe, 23. Podlesje, 24. Lakedemonovka 1/, 25. Nedvigovka-Tanais, 26. Rostov-na-Donu - Vertoletnoe Pole 1/, 27. Olimpiyskiy, 28. Nizhne-Gnilovskiy, 29. Mukhin I, 29a. Polyakov 1/, 30. Sadovyy 64/, 31. Kuleshovka, 32. Novoaleksandrovka I, 33. Alitub, 34. Otradnyy 3/, 35. Ryabichev 3/, 36. Kostyrskiy VIII 3/, 37. Konstantinovsk-Tankin 2/, 38. Zakatnoe I, 39. Zimogore 2/?, 40. Bogdanovka 1/?, 41. Terny 9/?, 42. Liubimovka 3/?, 43. Novopilipovka, flat cemetery - Akkerman I, 44. Chkalovka 3/?, 45. Solnechnyy 2/?, 46. Razumovka 1/?, 47. Ordzhonikidze-Chkalovskaya 3/?, 48. Osokorovka, 49. Kovalevka 4/?, 50–51. Usatovo, kurgan cemetery 1, kurgans 1, 6, 13; kurgan cemetery 2, kurgan 2, 52. Aleksandrovka, 53. Trapovka 10/?, 54. Sărăteni 1/?, 55. Purcari 1-2/?, 56. Sucleia 3/?, 57. Purcari 147/?, 58. Bursuceni

relative diachronic chronological position. The Budzhak burials are later, and the burials with temple rings are earlier.

This idea is confirmed by the following arguments.

One of the main arguments is related to the origin and distribution of the temple rings. According to T. STÖLLNER (2016), golden rings originated in the 4th millennium BC in Transcaucasia region, where they are associated with Kura-Arak culture (*Fig. 16*). In the second half of the 4th millennium BC different variations of circle-shaped and spiral-shaped rings appear in the Maykop culture of the Northern Caucasus. Artefacts of various types or different variations were mainly made of gold (*Fig. 17.A/1–19; B.1–21*).

The spread of Maykop influences to the north caused the appearance of these ornaments in Ancient Yamnaya culture, which is confirmed by the burial near the village of Pavlovskoe, where the silver ring was found together with the axe of Maykop type (SINIUK 1983, 25, *Fig. 8. 7, 10*). However, the distribution of these ornaments (predominantly made of silver) is mainly associated with western areas, where they are known complexes of Koysug-Konstantinovka (*Fig. 17.A/20–33; B/24–37*), Zhivotilovka and Post-Mariupol types (*Fig. 17.A/34–42; B/38–48*), and especially Late Tripolye sites of Usatovo and Gordinești types (*Fig. 17.A/43–54; B/49–58*).

It is complicated to speculate if the Yamnaya populations reaching the Carpathian-Dniester region brought these ornaments from the steppe or they represent influences from the Usatovo group. In any case, in the analysed region these rings are one of the most archaic.

The chronological correlation between tubular beads and composed bracelets is different. Despite copper beads being well known in various cultures since the early Eneolithic (for instance, composed bracelet from Cărbuna deposit). However, such finds are very rare in all these cultures. In the Bronze Age of Eastern Europe, Budzhak type sites represent the earliest evidence for the wide character of fashion. Therefore, compared to the spiral-shaped rings, the chronological position of the copper bracelet is later.

The other argument is the stratigraphic position of complexes referred to the two groups (*Fig. 18*).

As stated above, only four (5.4%) barrows with Budzhak type vessels are the main graves. All the other graves are secondary and associated with earlier barrows (*Fig. 18.3/A–B*). A similar correlation is

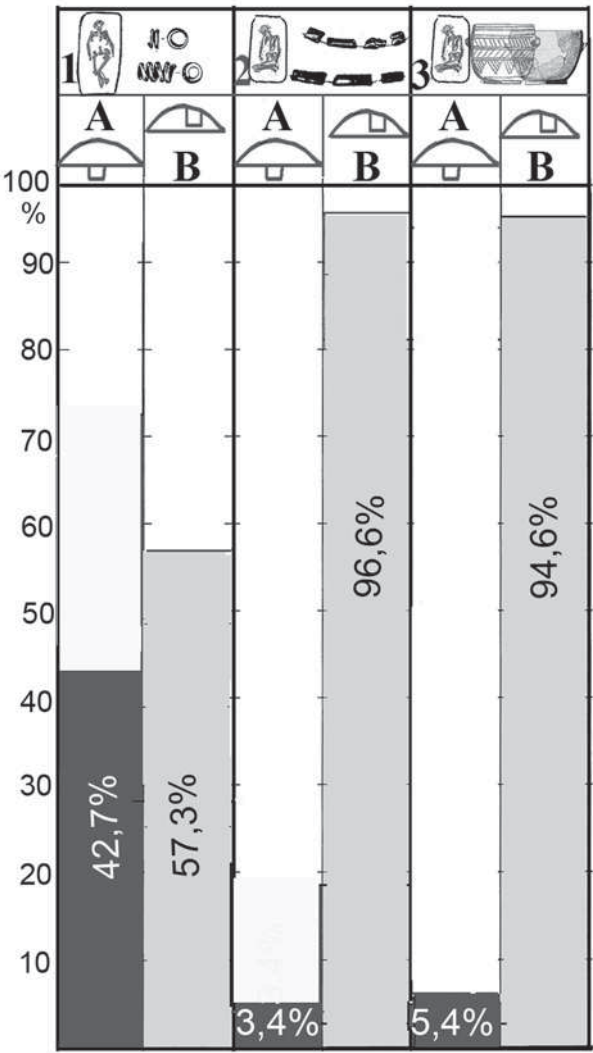


Fig. 18. Proportions of the stratigraphic position of burial types (positions) and diagnostic inventory:
A – main, earliest graves, B – secondary graves

represented by complexes with copper beads, where only 3.4% are the main graves, while the others are secondary graves (Fig. 18.2/A–B).

The related values estimated for the complexes with spiral-shaped rings are different. Here, 42.7% are the main graves, and the other 57.3% are the secondary graves (Fig. 18.1/A–B).

Therefore, the chronological position of spiral-shaped rings and copper beads compared to the chronology of composed bracelets, their stratigraphic relation results in a single conclusion. Graves with spiral-shaped rings are relatively earlier, and graves with Budzhak type vessels and copper beads are relatively later.

Further analysis requires consideration of several categories and types of finds identifying the internal chronology of Yamnaya sites in the analysed region. I have listed these chronological markers 40 years ago. These are the anthropomorphic stelae, remains of wagons and a series of ceramic forms (DERGACHEV 1986, 75, 84, fig. 18; fig. 19). Of course, the introduction of the significant amount of new data obtained in the last decades suggests the preliminary work on its classification, which is not among the aims of this paper. Therefore, we provide the two figures representing the correlation

between categories and types of finds from different graves (supine with the legs raised at the knees, and individuals laid on the back, with an inclination on the left/right side or just crouched on a side). Let us briefly comment on these figures.

Categories and types associated with the crouched on a side burials are represented in *Figure 19*. They are characterised by rich and various grave goods. The highest variability is noted for the ceramic complex, mostly including unusual (lacking in other cultures) shapes, which are represented by dozens of items. These are the cup-shaped forms, with two handles which have vertical holes (*Fig. 19.I/1–7*) or do not have holes (*Fig. 19.I/8–15*), conical (*Fig. 19.I/16–18*) and semi-spherical (*Fig. 19.I/19–23*) bowls.

Amphora-shaped vessels have attached handles with vertical holes (*Fig. 19.II/1–11*) or are characterised by high proportions and handles of different types (*Fig. 19.II/12–17*).

Specific shapes are noted for various goblet-shaped vessels (*Fig. 19.III/1–7*), "askoi" (*Fig. 19.IV/1–4*), jugs (*Fig. 19.IV/5–6*) and single-handle mug-cups (*Fig. 19.IV/7–12*).

The complex of tools and weapons, especially flint axes-adzes (*Fig. 19.V/1–4*) and bone arrowheads (*Fig. 19.V/5–7*), require additional attention.

The specific of ornaments was already discussed (*Fig. 19.VI/1–3*). Among the other categories rarely accompanying crouched on a side burial we should mention anthropomorphic stelae (*Fig. 19.VI/4–7*) and wagon parts (*Fig. 19.VI/8–9*).

The inventory accompanying supine burials with the legs raised at the knees is very much different (*Fig. 20*). Unlike the group discussed above, these graves are not characterised by their "own" forms of cup-shaped or bowl-shaped vessels. The only exception is represented by a cup of S-shaped profile, definitely imported from the outside (*Fig. 20.I/1–3*).

Amphorae with attached handles with vertical holes are rare in these graves. Most probably, they are incorporated from the group discussed above (*Fig. 20.II/1–4*). Imported vessels of Globular Amphorae culture known from Middle Prut are also rare (*Fig. 20.II/5–8*). The same observation is made for the amphorae of tall proportions (*Fig. 20.II/9–11, 14*) and spherical-body amphorae (*Fig. 20.II/12–13*), goblet-shaped vessels, "askoi" and jugs (*Fig. 20.III/1–4; Fig. 20.IV/1–2*).

These graves are accompanied by tools and weapons made of stone (axes), flint (arrowheads, knives) or copper and bronze. However, such finds are rare. They rather have a common cultural, "epoch-defining" character.

Three categories of "common Yamnaya" cultural horizon are most common for this group. These are spiral-shaped rings (*Fig. 20.V/1–3*), anthropomorphic stelae (*Fig. 20.VI/1–6*) and wagon parts (*Fig. 20.VI/7–12*) mainly concentrating in the steppe, but also known for the forest-steppe zone.

Since these groups include funeral rites as a main component, which has chronological significance, these groups represent stable correlations of quantitative and qualitative parameters. The parameters reflect two main periods of the development of the Yamnaya culture between Carpathians and Dniester, the Early (*Fig. 20*) and the Late (*Fig. 19*).

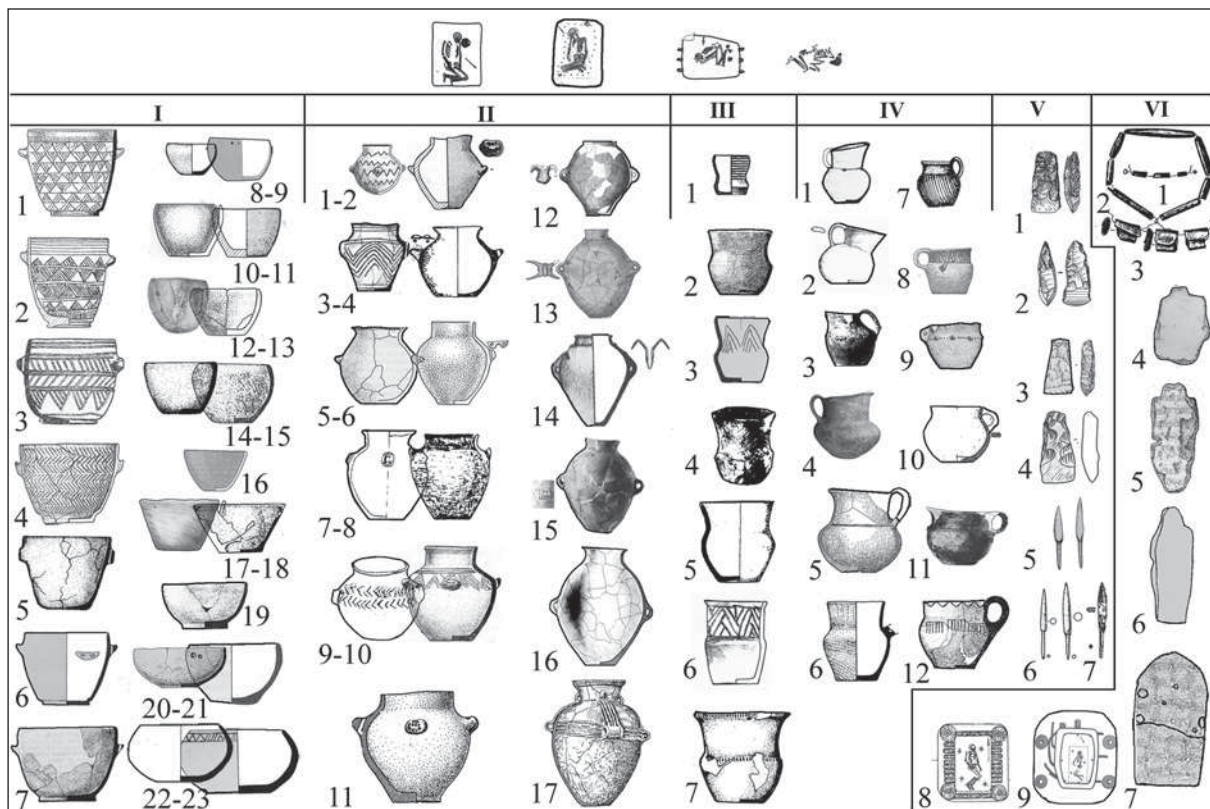


Fig. 19. Diagnostic materials of typical burials with individuals on the back with an inclination on the side representing the Late period of Yamnaya culture between Carpathians and Dniester:

I. Cup-shaped vessels and bowls: 1. Dubosari 4/4 (after KETRARU et al. 2014), 2. Semenovka 8/18 (after SUBBOTIN – RAZUMOV – SINIKI 2017), 3. Grigorievka 1/12 (after SUBBOTIN 1982), 4. Corjevo 8/14 (after BORZIYAK – MANZURA – LEVITSKIY 1983), 5. Crasnoe 9/23 (after SEROVA – YAROVY 1987), 6. Mayaki IV 1/1 (after CHERNYAKOV et al. 1982), 7, 19. Răscăești Noi 2/12 (after YAROVY 1990), 8. Cazacilia 17/14 (after SAVA – AGULNIKOV – MANZURA 2019), 9. Vlădiceni 9/8 (after GUDKOVA et al. 1984), 10. Ciobrucia II 1/12 (after DERGACHEV 1973), 11. Semenovka 2/3 (after SUBBOTIN – RAZUMOV – SINIKI 2017), 12. Mirnoe II 1/9 (after ALEKSEEVA 1974), 13. Baranovo 1/9 (after IVANOVA – PETRENKO – VETCHINNIKOVA 2005), 14. Mologa 2/25 (after MALIUKEVICH – AGULNIKOV – POPOVICH 2017), 15. Speia 1/5 (after DERGACHEV – MANZURA – SAVA 1992), 16. Dobrianka 1/6, 17. Porogi 3A/18 (after HARAT – POTUPCZYK – RAZUMOV 2014), 18. Bolotești-Vrancea 2/14 (after BUZDUGAN – BOBI – CERNEA 1987), 20. Feștești II 1/2 (after VYSOTSKIY 1992), 21. Kholmokoe 2/8 (after CHERNYAKOV – STANKO – GUDKOVA 1986), 22. Alkaliya 8/3 (after SUBBOTIN et al. 1987), 23. Mikhailovka 3/12 (after CHERNYAKOV et al. 1983);

II. Amphora-shaped vessels: 1. Baranovo 9/3 (after IVANOVA – PETRENKO – VETCHINNIKOVA 2005), 2. Semenovka 2/6 (after SUBBOTIN – RAZUMOV – SINIKI 2017), 3. Olănești 1/15 (after YAROVY 1990), 4. Primorskoe 1/13 (after CHEBOTARENKO – TOSHCHEV – CHERNYAKOV 1993), 5. Kholodnaya Balka 1/7 (after PETRENKO 2010), 6. Taraclia I 1/13 (after DERGACHEV – SAVA 2016), 7. Tatarbunary 1/2 (after SUBBOTIN 1988), 8. Gura Bîcului 7/1 (after DERGACHEV 1984), 9. Kholmokoe 2/13 (after CHERNYAKOV – STANKO – GUDKOVA 1986), 10. Gradeshka I 5/11 (after SUBBOTIN – OSTROVERKHOV – DZIGOVSKIY 1995), 11 – Novoselitsa 19/13 (after SUBBOTIN – OSTROVERKHOV – DZIGOVSKIY 1995), 12–13. Porogi 3/4, 4/8 (after HARAT – POTUPCZYK – RAZUMOV 2014), 14. Ocnîța 6/18 (after MANZURA – KLOCHKO – SAVVA 1992), 15. Efimovka 10/7 (after SHMAGLIY – CHERNYAKOV 1985) 16. Bursuceni 1/14 (after YAROVY 1978), 17. Valea Lupului 1/22 (after DINU 1957);

III. Goblet-shaped vessels: 1. Mirnoe 1/12 (after ALEKSEEVA 1979), 2. Purcari 1/23 (after YAROVY 1990), 3. Trapovka 4/5 (after VANCHUGOV – ZAGINAYLO – TOSHCHEV 1976), 4. Efimovka 9/17 (after SHMAGLIY – CHERNYAKOV 1985), 5. Ogorodnoe III 1/16 (after SUBBOTIN – ZAGINAYLO – SHMAGLIY 1970), 6. Brăilești 1/34 (Harțușche 2002), 7. Bolotești-Vrancea 2/7 (after BUZDUGAN – BOBI – CERNEA 1987);

IV. "Askos" pots, jugs, mug-cups: 1. Kubey 26/4 (after SUBBOTIN et al. 1987), 2. Brăilița 1/10 (after HARȚUCHE 2002), 3. Smeeni-Movila Mare /13 (after FRÎNCULEASA et al. 2017), 4. Gherăseni /117 (after GARVĂN – SIMALCSIK – FRÎNCULEASA 2018), 5. Răcăciuni (after TUDOR 1973), 6. Cazaclia 17/27 (after SAVA – AGULNIKOV – MANZURA 2019), 7. Bolotești-Vrancea 2/9 (after BUZDUGAN – BOBI – CERNEA 1987), 8. Hirșova 1/2 (after MORINTZ – ȘERBĂNESCU 1974), 9. Liești-Arbănașu 1/22 (after BRUDIU 2003), 10. Glinoe II 110/5 (after RAZUMOV et al. 2013), 12. Olănești 1/28 (after YAROVY 1990);

V. Tools and weapons: 1. Nicolscoe 11/7 (after AGULNIKOV – SAVA 2004), 2. Semenovka 8/13 (after SUBBOTIN – RAZUMOV – SINIK 2017), 3. Mayaki III 9/1 (after CHERNYAKOV et al. 1982), 4. Roșcani 1/13 (after DERGACHEV – BORZIYAK – MANZURA 1989), 5. Glinoe 1/1 (after YAROVY – SAVVA 1983), 6. Brăviceni 16/9 (after LARINA – MANZURA – KHAKHEU 2008), 7. Podoima 3/4 (after BUBULICH – KHAKHEU 2002);

VI. Ornaments: 1. Glubokoe 1/24, 2. Liman 3A/30, 3. Alkaliya 33/3 (after SUBBOTIN 2003); Anthropomorphic stelae: 4. Timkovo 1/12 (after DEMCHENKO – LEVITSKIY 1999), 5. Olănești 2/1 (after YAROVY 1990), 6. Plavni 25/1 (after ANDRUKH – DOBROLIUBSKIY – TOSHCHIEV 1985), 7. Mayaki III 1/4 (after CHERNYAKOV et al. 1982); Wagons: 8. Balabanu I 13/13 (after SAVA – AGULNIKOV – MANZURA 2019), 9. Petrești 3/9 (after YAROVY 1985)

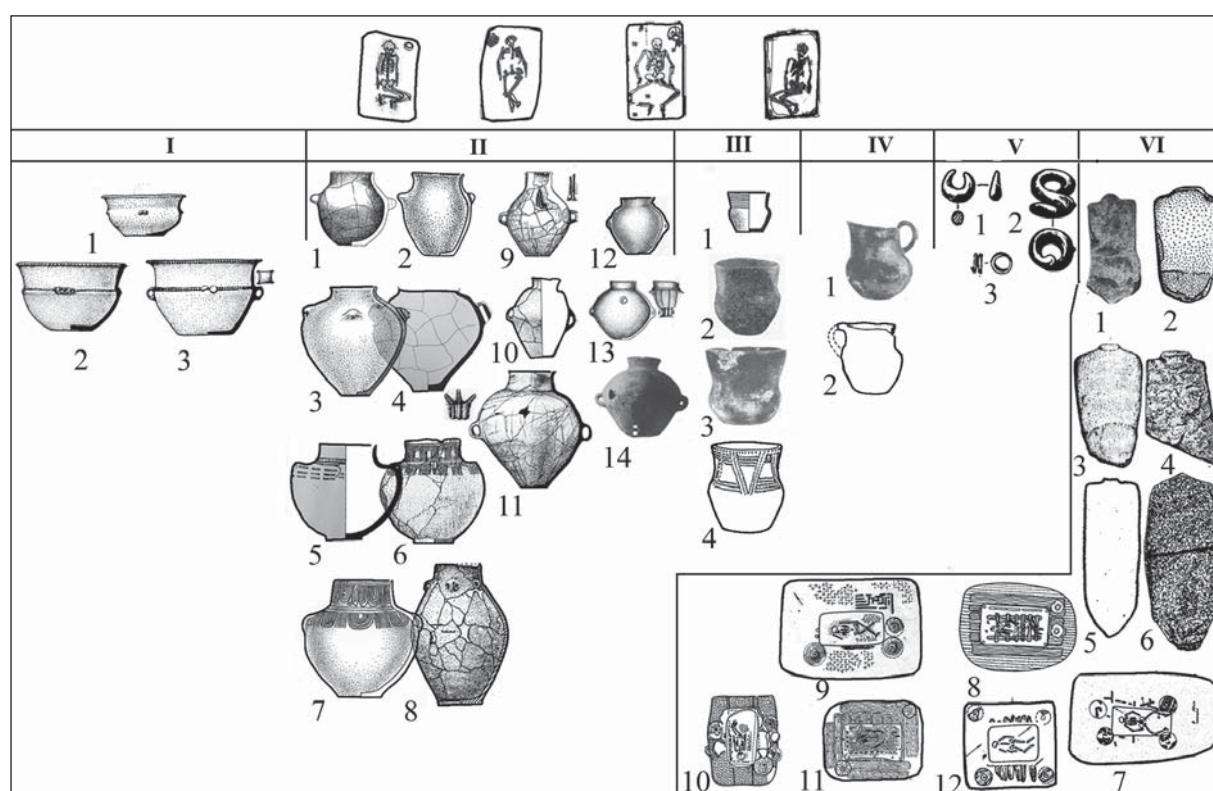


Fig. 20. Categories of data typical for supine burials with the legs raised at the knees representing the Early period of the Yamnaya culture between Carpathians and Dniester:

I. Cup-shaped vessels and bowls: 1–2. Cazaclia 15/2, 8/5, 3. Taraclia II, 14a/2 (after SAVA – AGULNIKOV – MANZURA 2019);

II. Amphora-shaped vessels: 1. Rogojeni 1/1 (after AGULNIKOV – MISTREANU – POPOVICI 2014), 2. Tudora II 1/10 (after MELIUKOVA 1962), 3, 7. Corpaci 8/13, 8/12 (after YAROVY 1984), 4–5. Bădragii Vechi 29/14, 25/12 (after YAROVY – CHIRKOV 1987; 1989; YAROVY – CHIRKOV – BUBULICH 1990), 6. Ocița 3/14 (after MANZURA – KLOCHKO – SAVVA 1992), 8. Mărculești 3/5 (after LEVINSKIY – TENTIUK 1990), 9. Tîrpești /1 (after MARINESCU-BÎLCU 1964), 10. Taraclia II 10/19, 11. Cazaclia 5/13 (10–11. after SAVA – AGULNIKOV – MANZURA 2019), 12. Iablona 1/1 (after YAROVY 1983), 13. Căușeni 1/4 (after CHEBOTARENKO – YAROVY – TELNOV 1989), 14. Ostrovnoe 2/12 (after ALEKSEEVA 1976);

III. Goblet-shaped vessels: 1. Butor I 9/3 (after SINIKA – RAZUMOV – TELNOV 2013), 2. Belyaevka 1/32 (after SHMAGLIY – CHERNYAKOV 1985), 3. Glubokoe 2/8 (after SHMAGLIY – CHERNYAKOV 1970), 4. Efimovka 9/17 (after SHMAGLIY – CHERNYAKOV 1985);

IV. “Askos” pots, jugs: 1. Glubokoe 2/11 (after SHMAGLIY – CHERNYAKOV 1970), 2. Bolgrad 1/12 (after SUBBOTIN – SHMAGLIY 1970);

V. Ornaments: 1. Plavni 26/4, 2. Brăviceni 2/7; 3. Taraclia II 10/10 (after SUBBOTIN 2003);

VI. Anthropomorphic stelae: 1. Glubokoe 1/7 (after SHMAGLIY – CHERNYAKOV 1970), 2. Novoselitsa 19/7 (after SUBBOTIN – OSTROVERKHOV – DZIGOVSKIY 1995), 3. Tomai 1/13 (after LEVITSKIY 1988), 4. Căușeni 1/3 (after CHEBOTARENKO – YAROVY – TELNOV 1989), 5. Sanzheyka 1/2 (after ALEKSEEVA 1973), 6. Mologa 1/4 (after MALIUKOVICH – AGULNIKOV – POPOVICH 2017);

Wagons: 7. Novoselitsa 19/16 (after SUBBOTIN – OSTROVERKHOV – DZIGOVSKIY 1995), 8–9. Kholmokoe 2/10, 1/7 (after CHERNYAKOV – STANKO – GUDKOVA 1986), 10. Taraclia II 10/18 (after SAVA – AGULNIKOV – MANZURA 2019), 11. Nicolscoe 7/33 (after AGULNIKOV – SAVA 2004), 12. Mayaki I 5/5 (after SHMAGLIY – CHERNYAKOV 1985)

Conclusions

Carpathian-Dniester regional variation would be an appropriate term characterising the taxonomic position of the analysed sites in the system of Yamnaya cultural complex as a complicated cultural unit, this conclusion somewhat disagrees with recommendations of L. S. KLEYN (2016, 6). This regional variation is differentiated from Balkan, Tisza or Southern Bug variations, as well as the other regional variations in the east.

Sites of the Carpathian-Dniester region are sub-divided into two periods. The earlier period is conditionally labelled as a *Dniester* one. The later period is labelled as *Budzhak*. These labels underline chronological difference, rather than territorial separation.

Acknowledgements

I would like to express my gratitude to Dr. A. Dyachenko for the translation from Russian. I am also infinitely grateful to Dr. D. Topal and Dr. B. Preda-Bălănică for valuable remarks, suggestions and proofreading of the text of the paper.

ANNEX I

Burials of the Yamnaya culture with Budzhak vessels. The numbers in the table correspond to the numbers on the map from *Figure 3*.

Abbreviations: **L** – on the back with an inclination on the left side; **R** – on the back with an inclination on the right side; **S** – supine position with raised legs; **Di** – dismembered; **Kf** – cenotaph.

No.	SITE	Dimensions of vessels		Position	Source
		Max. H	Max. D	RLS Di Kf	
1	Mocra 1/3	170	190	R	SHCHERBAKOVA – KASHUBA 1991, Tab. VIII, 3 KETRARU <i>et al.</i> 2014, Fig. 40.1–2; Fig. 95.1–2
2	Dubăsarii Noi 4/4	150	175	L	
3	Dubăsarii Noi 31/7	150	170	L	

No.	SITE	Dimensions of vessels		Position	Source
	<u>Name barrow/grave</u>	Max. H	Max. D	RLS Di Kf	
4	Crasnoe 9/23	115	115	L	SEROVA – YAROVY 1987, Fig. 36.1–2, 5
5	Crasnoe 9/23	135	155	L	
6	Tiraspol area	120	180	-	DERGACHEV 1973, Khiam. 4441
7	Nicolscoe 7/45	125	145	Di	AGULNIKOV – SAVA 2004, Fig. 32.3–4; Fig. 51.1–2
8	Nicolscoe 10/4	140	150	L	
9	Slobozia 1/25	140	185	R	SHCHERBAKOVA – TASHCHI – TELNOV 2008, Fig. 10.1–2
10	Grigorevka 1/12	152	165	L	SUBBOTIN 1982, Fig. 1.7–8
11	Revova 3/7	165	195	L	IVANOVA – PETRENKO – VETCHINNIKOVA 2005, Fig. 40.1–3
12	Velikozimenovo 1/2	145	140	L	IVANOVA – PETRENKO – VETCHINNIKOVA 2005, Fig. 33.1–2
13	Shcherbanka 1/10	107	117	L	BEYLEKCHI 1993, Fig. 7.1, 3
14	Starye Bilyary 1/14	160	200	L + R	PETRENKO 1991, Fig. 27.1–8
15	Vapnyarka 4/16	150	170	R	IVANOVA – VETCHINNIKOVA 2009, Fig. 4.1–2
16	Yasski 2/5	145	150	L	
17	Yasski 3/6	72	74	R	ALEKSEEVA 1992, Fig. 15.12; Fig. 18.5
18	Yasski 6/14	63	75	R + Di	
19	Belyaevka 1/20	70	120	L	ALEKSEEVA 1971, Fig. 3.4
20	Belyaevka 2/10	105	115		PETRENKO 2007, Fig. 8
21	Mayaki III 2/7	130	150	S	CHERNYAKOV <i>et al.</i> 1982, Fig. 52.5–6; CHERNYAKOV <i>et al.</i> 1983, Fig. 14.1–4; Fig. 21.1–4; Fig. 30.1–6
22	Mayaki IV 1/1	140	150	R	
23	Mayaki 3/1	100	105	R	
24	Mayaki 9/1	120	130	L	
25	Efimovka 2/14	178	180	L	SHMAGLIY – CHERNYAKOV 1985, Fig. 2.1–3; Fig. 3.1; Fig. 4.4–5
26	Efimovka 3/5	118	120	L	
27	Efimovka 6/6	110	125	R	
28	Novaya Dolina 1/2	50	65	?	ALEKSEEVA 1979
29	Grigorăuca 1/8	47	80x130	L	AGULNIKOV – POPOVICH 2009, Fig. 4.1–6
30	Brăviceni 16/9	133	175	L ?	LARINA – MANZURA – KHAKHEU 2008, Fig. 40.1–5
31	Dubăsarii Vechi 1/28	52	8x142	L	BORZIYAK – LEVITSKIY 1989, Fig. 4.5
32	Corjovo 1 (8)/4	115	130	R	BORZIYAK – LEVITSKIY 1989, Fig. 3.1–2; BORZIYAK – MANZURA – LEVITSKIY 1983, Fig. VI.3
33	Corjovo 2/13	135	142	R	
34	Chirca 1/7	125	135	L	DERGACHEV – SAVA 2002, Fig. 23.2–3
35	Beriozchi d.g.	78	102	-	DERGACHEV 1975, Fig. 2.12
36	Roșcani 1/13	140	196	L	DERGACHEV – BORZIYAK – MANZURA 1989, Fig. 6.2–8
37	Gura Bîcului 3/2	105	140	R	DERGACHEV 1984, Fig. 4.1–3; Fig. 7.1–2
38	Gura Bîcului 5/13	102	135	L	
39	Ursoaia 3/12	197	192	L	CHEBOTARENKO – YAROVY – TELNOV 1989, Fig. 54.1–2
40	Cîrnățeni 6/9	140	150	L	DEMCHENKO – LEVITSKIY 1997, Fig. 10.5, 9
41	Talmază 3/15	85	140	S	AGULNIKOV – ANTIPENKO 1990, Fig. 22.8, 13
42	Ciobrucu 4/10	115	160	L	AGULNIKOV – ANTIPENKO 1990, Fig. 9.2, 7
43	Răscăeții Noi 2/12	130	175	R	YAROVY 1990, Fig. 5.1–3

No.	SITE	Dimensions of vessels		Position	Source
		Max. H	Max. D	RLS Di Kf	
44	Popeasca 1/9	110	115	R	VYSOTSKIY 1992, Fig. 6.1, 4
45	Purcari 1/23	125	125	R	YAROVY 1990, Fig. 31.3, 7–8
46	Olănești 1/26	45	60	R	YAROVY 1990, Fig. 65.1–4; Fig. 78.2; Fig. 87.2–3
47	Olănești 1/26	-160?	-170?	R	
48	Olănești 6/4	130	180	Kf	
49	Olănești 13/2	70	92	R	
50	Căplani 1/15	105	125	R	AGULNIKOV 1984, Fig. 3.5, 10
51	Semenovka 2/2	120	152	L	SUBBOTIN – RAZUMOV – SINIKI 2017, Fig. 9.8–12; Fig. 23.1–2; Fig. 36.1–2; Fig. 46.4–5; Fig. 54.3–5
52	Semenovka 8/18	164	152	L	
53	Semenovka 12/2	175	194	L	
54	Semenovka 14/21	137	175	R	
55	Semenovka 19/4	160	182	L ?	
56	Sadovoe 1/14	110	110	L	MALIUKEVICH – AGULNIKOV – POPOVICH 2017, Fig. 6.7–8; Fig. 7.4–6
57	Sadovoe 1/18	120	145	L	
58	Polevoe 1/5	?	?	?	CHERNYAKOV <i>et al.</i> 1983, Fig. 5.1–4; Fig. 6.1–2
59	Polevoe 1/8	98	140	L + R	
59a	Polevoe 2/6	60	80	L + R	
60	Shirokoe 5/3	100	110	R	SUBBOTIN <i>et al.</i> 1987, Fig. 57.4–7; Fig. 58.1–8
61	Shirokoe 5/6	175	225	L	
62	Diviziya 2 6/3	175	192	L	SUBBOTIN – SAPOZHNIKOV – SUBBOTIN 2002, Fig. 7.3–6
63	Zheltyy Yar 3/12	85	100	?	SUBBOTIN <i>et al.</i> 1981, Tab. 19, 7–11
64	Zarya-Mikhailovka 3/6	90	90	L	CHERNYAKOV <i>et al.</i> 1982, Fig. 21.1–4
65	Zarya-Mikhailovka 3/8	160	170	Kf	CHERNYAKOV <i>et al.</i> 1982, Fig. 23.3–4
66	Zarya-Mikhailovka 3/12	180	200	L	CHERNYAKOV <i>et al.</i> 1982, Fig. 27.1–5
67–	Trapovka 1/8	110	134	Di	SUBBOTIN – OSTROVERKHOV – DZIGOVSKIY 1995, Fig. 4.6–11
68	Trapovka 1/8	96	140	Di	
69	Vishnevoe 17/31	95	110	R	DVORYANINOV – DZIGOVSKIY – SUBBOTIN 1985, Fig. 9.1–2; Fig. 9.6–7
70	Vishnevoe 17/36	110	145	L	
71	Novoselitsa 19/19	100	130	L	SUBBOTIN – OSTROVERKHOV – DZIGOVSKIY 1995, Fig. 29.5–6
72	Bashtanovka 4/25	162	175	L	SHMAGLIY – CHERNYAKOV 1970, Fig. 60.4
73	Glubokoe 1/25	178	185	L	SHMAGLIY – CHERNYAKOV 1970, Fig. 38.2
74	Strumok 5/6	120	160	L	GUDKOVA <i>et al.</i> 1979, Tab. XVI, 5–6
75	Nerushay 9/56	75	84	L	SHMAGLIY – CHERNYAKOV 1970, Fig. 15.1, 5
76	Nerushay 9/74	78	10	L + R	
77	Primorskoe 1/34	115	160	L	CHEBOTARENKO – TOSHCHIEV – CHERNYAKOV 1993, Fig. 4.8–9
78	Chervonnyy Yar 1/2	143	145	?	ALEKSEEVA 1974, Fig. 27
79	Kholmskoe 1/4	115	145	R+ R	CHERNYAKOV – STANKO – GUDKOVA 1986, Fig. 3.1
80	Kislitsa 8/16	115	105	R	GUDKOVA – TOSHCHIEV – CHEBOTARENKO 1995, Fig. 8.6–7
81	Novokamenka 1/5	70	90	L	SHMAGLIY – CHERNYAKOV – ALEKSEEVA 1971; ALEKSEEVA 1992, Fig. 19.1–3
82	Novokamenka 1 mound	155	180	-	
83	Plavni 9/12	180	210	L	ANDRUKH – DOBROLIUBSKIY – TOSHCHIEV 1985, Fig. 17.3; Fig. 18.1
84	Plavni 15/5	115	125	R	

No.	SITE	Dimensions of vessels		Position	Source
	<u>Name barrow/grave</u>	Max. H	Max. D	RLS Di Kf	
85	Nagornoe 14/15	155	160	L	TOSHCHEV 1992, Fig. 4.8
86	Frikatsey 10/14	160	175	L	GUDKOVA <i>et al.</i> 1981, Tab. L, 5–6
87	Etulia II 1/6	73	101	L	BORZIYAK 1984, Fig. 6
88	Giurgiulești 2/14	105	135	?	KHAKHEU – POPOVICH 2019, Fig. 3.7
89	Balabanu 13/10	?	?	?	CHEBOTARENKO – YAROVY – TELNOV 1989, Fig. 24.4, 6
90	Svetlii 3/10	140	180	?	MANZURA 1984, Fig. 6.4
91	Sărăteni 3/13	110	130	R	LEVIȚKI – MANZURA – DEMCHENKO 1996, Fig. 29.1–2; Fig. 50.2–3
92	Sărăteni 6/4	122	160	L	
93	Vlădești T.216 1/2	170	175	L	BRUDIU 2003, Fig. 32.1
94	Murighiol 4/6	106	116	?	SIMION 2003, Fig. 4.3
Total 94 cases				L-51, R-30, S-2, Di-4, Kf-2, ?-7	

ANNEX II

Burials of the Yamnaya culture with temple spiral rings. The numbers in the table corresponds to the numbers on the map from *Figure 10*.

Abbreviations: Position: L – on the back with an inclination on the left side; R – on the back with an inclination on the right side; S – supine position with raised legs; Ce – primary; Se – secondary.

No.	SITE	Types		Position		Source
	<u>Name barrow/grave</u>	Spiral-shaped	Bagel-shaped	S R L	Ce Se	
		Au Ag Cu				
1	Pisarivka 5/1	1Ag	1Ag	S	Ce	HARAT – POTUPCZYK – RAZUMOV 2014, Fig. 2.I–II
2	Cuzmin 3/2	1Ag	-	S	Se	BUBULICH – KHAKHEU 2002, Fig. 12.C
3	Crasnoe 2/5	2Ag	-	S	Se	SEROVA – YAROVY 1987, Fig. 7.2–3; Fig. 34.2–3
4	Crasnoe 9/19	2Ag		S	Se	
5	Blizhniy Khutor 3/1	1Ag 1Cu	-	S	Ce	SINIKA <i>et al.</i> 2015, Fig. 8.3–6
6	Tiraspol II 3/18	2Ag	-	S	Se	SAVA 1988, Fig. 6.1, 6
7	Nicolscoe 1/11	1Ag	-	R	Se	AGULNIKOV – SAVA 2004, Fig. 5.5, 8
8	Ciobruți II 1/11	2Cu	-	S	Se	DERGACHEV 1973, Fig. 13.11
9	Glinoe Sad 1/4	1Ag	-	S	Se	TELNOV <i>et al.</i> 2013, Fig. 45.1–3
10	Katorzhino 1/11	1Ag	-	S	Se/Ce	IVANOVA – PETRENKO – VETCHINNIKOVA 2005, Fig. 24.1–2
11	Baranovo-Soldatskaya Slava 1/10	2Ag	-	S	Se/Ce	IVANOVA – PETRENKO – VETCHINNIKOVA 2005, Fig. 15.1–2
12	Yasski 1/18	2Ag	-	S	Se	SUBBOTIN 2003, Tab. 45, 29–30; Tab.46, 11; ALEKSEEVA 1976, Tab. 37, 4
13	Yasski 5/22	2Ag	-	S	Se	
14	Nikolaevka/ Efimovka 10/10	1Cu	-	S		SUBBOTIN 2003, Tab. 44, 6

No.	SITE	Types		Position		Source
		Spiral-shaped	Bagel-shaped	S R L	Ce Se	
		Au Ag Cu				
15	Dobroaleksandrovka 1/5	1Ag	-	S	Ce	SUBBOTIN 2003, Tab. 45, 9
16	Odessa <i>Slobodka-Romanovka</i> 1/15	2Ag	-	S	Se	DOBROVOLSKIY 1915, 133
17	Sanzheyka 1/8	1Ag	-	S	Se	ALEKSEEVA 1973, OAM №87480
18	Karolino-Bugaz 1/1	2Ag	-	L	Se	ZAGINAYLO – CHERNYAKOV – PETRENKO 1987, Fig. 1.1, 12–13
19	Mărculești 3/10	1Cu	-	S	Ce	BEYLEKCHI 1992, Fig. 3.5–6
20	Bursuceni 1/12	2Cu?	-	S	Se	YAROVY 1978, Fig. 18
21	Brînzanii Noi 1/2	2(?)Cu	-	R	Se	AGULNIKOV – MISTREANU 2014, Fig. 5
22	Ciocîlteni 5/6	1Ag	-	S	Ce	KETRARU – KHAKHEU 1990, 69, no illustrations
23	Brăviceni 1/14	1Ag	-	S	Ce	LARINA – MANZURA – KHAKHEU 2008, Fig. 5.2; Fig. 9.3–4; Fig. 13.1; Fig. 19.3–5
24	Brăviceni 2/8	1Cu	-	R	Se	
25	Brăviceni 4/4	1Au	-	?	Ce	
26	Brăviceni 7/2	1Ag	1Ag	S	Ce	
27	Orhei 1/2	-	1Ag	R	Se	DERGACHEV 1973, Fig. 2.2
28	Orhei 1/6	1Ag	-	S	Se	
29	Roșcani 1/19	-	2Ag	S	Ce	DERGACHEV – BORZIYAK – MANZURA 1989, Fig. 6.7–13; Fig. 7.3–4
30	Roșcani 2/3	1Cu	-	?	Se	
31	Gura Bîcului 3/13	1Cu	-	S	Se	DERGACHEV 1984, Fig. 4.8–13; Fig. 6.7–9; Fig. 8.1–4
32	Gura Bîcului 5/3	1Cu	-	?	Se	
33	Gura Bîcului 7/1	1Cu	-	R	Se	
34	Hagimus 2/7	1Ag	-	S	Se	CHEBOTARENKO – YAROVY – TELNOV 1989, Fig. 70.3, 8
35	Căușeni II 1/10	-	1Ag	R	Ce	CHEBOTARENKO – YAROVY – TELNOV 1989, Fig. 35.3–5; Fig. 36.1–2
36	Căușeni II 1/13	2Ag	-	S	Se	
37	Talmază I 1/6	1Ag	-	S	Ce	AGULNIKOV – ANTIPENCO 1990, Fig. 16.1–3; Fig. 20.7–8
38	Talmază I 3/4	2Ag	-	R	Se	
39	Purcari 1/31	3Ag	-	L	Se	YAROVY 1990, Fig. 35.1–2
40	Olănești 1/16	1Ag	-	S	Se	YAROVY 1990, Fig. 63.5–6; Fig. 79.2, 4
41	Olănești 6/8	1Ag	-	R	Ce	
42	Semenovka 11/5	2Ag	-	S	Se	SUBBOTIN 2003, Tab. 44, 15–17; SUBBOTIN – RAZUMOV – SINIK 2017, Fig. 32.2–3
43	Sadovoe 1/26	2Ag	-	S	Ce	MALIUKEVICH – AGULNIKOV – POPOVICH 2017, Fig. 8.3–6; Fig. 14.1–4
44	Sadovoe 1/32	2Ag	-	S	Ce	
45	Shirokoe 33/7	2Ag	-	?	?	SUBBOTIN 2003, Tab. 46, 21–24
46	Shirokoe 33/9	2Ag	-	?	?	
47	Diviziya II 5/8	1Cu	-	S	Se	SUBBOTIN 2003, Tab. 43, 22
48	Belolese 7/4	5Ag	-	L	Se	SUBBOTIN 2003, Tab. 46, 1–5; SUBBOTIN – DZIGOVSKIY – OSTROVERKHOV 1998, Fig. 35.1–9
49	Novoselitsa 19/11	2Ag	-	S	Se	SUBBOTIN 2003, Tab. 45, 10–12
50	Novoselitsa 21/1	1Ag	-	S	Se	
51	Trapovka 1974 16/9	1Cu	-	L	Se	SUBBOTIN 2003, Tab. 44, 9
52	Liman-Zakhar. Mog. 3A/52	1Cu	-	S	Se	SUBBOTIN 2003, Tab. 43, 17–18; Tab. 44, 11
53	Liman 7/3	-	2Ag	R	Ce	

No.	SITE	Types		Position		Source
		Spiral-shaped	Bagel-shaped	S R L	Ce Se	
		Au Ag Cu				
54	Glubokoe 1/7	1Au	-	S	Se	SHMAGLIY – CHERNYAKOV 1970, Fig. 8.3–6; Fig. 64.15
55	Glubokoe 1/26	1Ag		S	Se	
56	Nerushay 1/14	1Ag	-	S	Ce	SHMAGLIY – CHERNYAKOV 1970, Fig. 8.2
57	Primorskoe 1/32	2Cu	-	R	Se	CHEBOTARENKO – TOSHCHIEV – CHERNYAKOV 1993, Fig. 4.5
58	Parapory 1/20	2Ag	-	S	Se	SUBBOTIN 2003, Tab. 46, 12
59	Shevchenkovo 3/6	2Ag	-	S	Se	SUBBOTIN 2003, Tab. 46, 14
60	Kholmskoe 2/37	2Ag	-	S	Ce	CHERNYAKOV – STANKO – GUDKOVA 1986, Fig. 9.10–11; SUBBOTIN 2003, Tab. 44, 8; Tab. 46, 6
61	Kholmskoe 8/6	1Cu	-	?	Se	
62	Ostrovnoe 2/6	2Ag	-	S	Ce	SUBBOTIN 2003, Tab. 45, 5–8
63	Ostrovnoe 2/7	2Ag	-	S	Ce	
64	Utkonosovka 6/1	3Ag	-	S	Se	SUBBOTIN 2003, Tab. 45, 20–22
65	Bogatoe 2/11	1Ag	-	S	Se	SUBBOTIN 2003, Tab. 44, 12
66	Plavni 8/31	1Ag	-	S	Se	SUBBOTIN 2003, Tab. 46, 29, 32
67	Plavni 25/1	1Cu	-	L	Ce	
68	Plavni 26/7	1Au	-	L?	Se	
69	Mrestnota Mogila 2/7	2Cu	-	L	Se	GUDKOVA <i>et al.</i> 1984, Fig. 41.6–7
70	Kurchi 20/16	2Cu	-	?	?	SUBBOTIN 2003, Tab. 46.15–16
71	Ogorodnoe III 1/6	2Cu	-	?	?	SUBBOTIN 2003, Tab. 46.27–28
72	Giurgiulești 2/9	3Ag	-	S	Ce	KHAKHEU – POPOVICH 2019, Fig. 4.16; Fig. 11.3–4
73	Giurgiulești 3/8	1Ag	-	R	Ce	
74	Giurgiulești 5/5	1Au	-	S	Ce	CIOBANU <i>et al.</i> 2019, 119
75	Găvănoasa 4/3	1Ag	-	S	Ce	AGULNIKOV 1992, Fig. 10.1–2
76	Crihana Veche 9/17	2Ag	-	S	Se	CIOBANU – AGULNICOV 2016, Fig. 23.1–2
77	Taraclia II 3/7	1Cu	-	R	Se	SAVA – AGULNIKOV – MANZURA 2019, Fig. 11.3–4; Fig. 27.2; Fig. 32.3–5; Fig. 48.2–6; SUBBOTIN 2003, Tab. 44, 7
78	Taraclia II 10/10	1Ag	-	S	Se	
79	Taraclia II 10/19	2Ag	-	S	Se	
80	Taraclia II 14/3	1Au 1Ag	-	S	Se	
81	Taraclia II 18/10	1Ag 1Cu	-	S	Se	
82	Balabanu I 13/12	1Ag	-	S	Se	CHEBOTARENKO – YAROVY – TELNOV 1989, Fig. 24.5; Fig. 25.3, 5
83	Balabanu I 13/15	2Cu	-	R	Ce	
84	Balabanu II 2/1	1Ag	-	S	Ce	SAVA – AGULNIKOV – MANZURA 2019, Fig. 67.2, 4
85	Cazaclia 17/3	1Ag	-	?	Se	SUBBOTIN 2003, Tab. 44, 19; SAVA – AGULNIKOV – MANZURA 2019, Fig. 120.5–6
86	Cazaclia 23/10	1Ag	-	S	Ce	
87	Petrești II 1/8	1Ag	-	S	Ce	YAROVY 1987, Fig. 7.1–2
88	Iablona 1/17	2Ag	-	S	Ce	YAROVY 1983, Fig. V.6
89	Duruitoarea Nouă 5/5	1Cu	-	S	Ce	DEMCHENKO 2007, Fig. 6.5, 8
90	Cuconești Vechi-Dumeni 9/21	1?	-	S	?	KETRARU <i>et al.</i> 1975; NIKOLAEVA – SAFRONOV 1976
91	Cuconești Vechi-Dumeni 12/4	1?	-	R	?	

No.	SITE	Types		Position		Source
		Spiral-shaped	Bagel-shaped	S R L	Ce Se	
		Au Ag Cu				
92	Corpaci 8/12	1Ag	1Ag	S	Ce	YAROVY 1984, Fig. 12.3
93	Bădragii Vechi 6/7	2Ag	-	S?	Ce	YAROVY – CHIRKOV 1987, Fig. 20.3–4; CHIRKOV 1989, Fig. 19.4–5
94	Bădragii Vechi 25/12	2Ag	-	S	Se	
95	Tețcani II, 1/10	1Ag	-	?	Ce	YAROVY 2010, Fig. 3, Tab. 6, 4–5
96	Broșteni 1/1	1Ag	-	L	?	PETRESCU-DÎMBOVIȚA 1950; ZAHARIA 1959, Fig. 4.1
97	Glăvăneștii Vechi (1949) I/10	1Cu	-	L	Ce	COMȘA 1987, Fig. 11.2–3, Fig. 12.3; COMȘA 1989, Fig. 8.1–4
98	Glăvăneștii Vechi (1949) I/12	-	1Cu	L	Se	
99	Glăvăneștii Vechi (1949) II/3	2Cu+Ag	-	L	Se	
100	Ivănești ?	2Cu+	-	?	?	COMAN 1980, 161
101	Vlădești 243/2	1Au	-	?	Se	BRUDIU 2003, Fig. 32.4
102	Vânători 222/13	1Ag	-	S	Ce	BRUDIU 2003, Fig. 18.2
103	Chilia Veche 1/89	1Ag	-	S	Se	VASILIU 1995a, Pl. IV, 5; Pl. VI, 3
104	Mihai Bravu 1/3	1?	-	S	Se	VASILIU 1995b, Pl. VI, 4–5
105	Mihai Bravu 1/4	-	1Ag	S	Ce	
106	Sabangia 3/2	1Ag	-	S	Ce	SIMION 2003, 46, Fig. 6.m. 2
107	Zebil-Movila Sărată		2Ag	?	?	FRÎNCULEASA <i>et al.</i> 2019, Anexa II, 63–64
108	Enisala	-	2Ag	?	?	FRÎNCULEASA <i>et al.</i> 2019, Anexa II 28–29
109	Rahman 1/2	1Ag	-	S	Se	AILINCĂI <i>et al.</i> 2014, Fig. 5; AILINCĂI <i>et al.</i> 2016, Fig. 10
110	Rahman 2/3	2Cu	-	R	Se	
111	Sultana-Movila Mare 1/1	2Cu	-	-	-	ȘERBĂNESCU – COMȘA 2012, 24–25
112	Sultana-Movila Mare 1/5	2Cu	-	-	-	
113	Gurbănești I/2	-	1Cu	S	Se	ROSETTI 1959, Fig. 15.1–3
114	Gurbănești II/7	1Cu	-	R	Se	
115	Gurbănești II/9	1Cu	-	R	Se	
116	Gurbănești II/12	1Ag	-	R	Se	
117	Blejoii III/1	1Cu+Ag	-	R	Ce	FRÎNCULEASA <i>et al.</i> 2019, Pl. X.1–4; FRÎNCULEASA <i>et al.</i> 2019, Pl. VI.1–6; Pl. VII.1–4; FRÎNCULEASA 2020, Pl. 11.1–8
118	Blejoii III/3	?	-	-	-	
119	Blejoii IV/1	4Ag	-	L	Se	
120	Ariceștii-Rahtivani I/1	1Ag+Au	-	S	Se ?	FRÎNCULEASA 2007, Pl. 3.3; Pl. 4.4–5; FRÎNCULEASA <i>et al.</i> 2013, Pl. 3.2–3; FRÎNCULEASA <i>et al.</i> 2014, Pl. 6.4; Pl. 9.3; Pl. 10.3; FRÎNCULEASA <i>et al.</i> 2019, Anexa II, 3–14
121	Ariceștii-Rahtivani I/3	-	2Ag	S	Ce ?	
122	Ariceștii-Rahtivani IV/4A	5Ag	-	?	?	
123	Ariceștii-Rahtivani IV/5B	1Ag	-	R	Ce	
124	Ariceștii-Rahtivani VII/2	2Ag	-	?	?	FRÎNCULEASA <i>et al.</i> 2019, Anexa II, 47–49, Pl. XII.m.15, m.20
125	Ploiești-Triaj 1/3	1Ag	-	?	?	
126	Ploiești-Triaj II/15	1Ag	-	L	?	
127	Ploiești-Triaj II/20	1Ag	-	L	?	BERCIU – ROMAN 1984, Fig. 1.3
128	Verbița 2/?	1Ag	-	S	?	
129	Plenița-Măgura Mare /1	2Ag	-	S	Ce	BERCIU 1952, Fig. 21

No.	SITE	Types		Position		Source
	<u>Name barrow/grave</u>	Spiral-shaped	Bagel-shaped	S R L	Ce Se	
		Au Ag Cu				
130	Zimnicea c.g. 4	1Ag		R	-	ALEXANDRESCU 1974, Pl. 8.1–7, 10–14; Pl. 9.1–2
131	Zimnicea c.g. 9		5Ag	R	-	
132	Zimnicea c.g. 11	2Ag		R	-	
133	Zimnicea c.g. 16	1Ag	-	R	-	
134	Zimnicea c.g. 20	3Ag	-	R	-	
135	Zimnicea c.g. 24	2Ag	-	L	-	
Total 135 complexes		Au-7 Ag-136 Cu-46 ?-4	Ag-19 Cu-2	S-76 R-25 L-14	Ce 44 Se 67	
		189+4	21			
		197+21=216				

ANNEX III

Burials of the Yamnaya culture with bracelets composed from thin copper plates. The numbers correspond to the numbers on the map from *Figure 13*.

Abbreviations: Position: **L** – on the back with an inclination on the left side; **R** – on the back with an inclination on the right side; **S** – supine position with raised legs; **Ce** – primary; **Se** – secondary; Place: **L** – left hand; **R** – right hand; **Ot** – other.

No.	SITE	Ex.	Position		Place	Source
	<u>Name barrow/grave</u>		R L S	Ce-Centr. Se-Second	R L Ot	
1	Mocra 1/6	1	L	Se	L	SHCHERBAKOVA – KASHUBA 1991, Tab. VIII, 1; SUBBOTIN 2003, Tab. 47, 20
2	Târnauca II 2/17	1	L	Se	L	AGULNIKOV – SAVA 2004, Fig. 99.2–3
3	Nicolscoe 7/7	1	R	Se	R	AGULNIKOV – SAVA 2004, 54
4	Slobozeia 1/21	3	L	Se	Ot	SHCHERBAKOVA – TASHCHI – TELNOV 2008, 29; SUBBOTIN 2003, Tab. 47, 12–14
5	Slobozeia 4/4	2	?	?	?	
6	Slobozeia 4/5	2	?	?	?	
7	Grigorevka 1/12	2+	L	Ce	R	SUBBOTIN 1982, 104
8	Novogrigorevka - Liubasha 2/2	3	?	Se	?	IVANOVA – PETRENKO – VETCHINNIKOVA 2005, Fig. 50.3–5
9	Katarzhino 1/1	2	R ?	Se	R	IVANOVA – PETRENKO – VETCHINNIKOVA 2005, 31, 41
10	Katarzhino 1/21	+?	S	Se	Ot	
11	Baranovo 1/9	1	L	Se	R	IVANOVA – PETRENKO – VETCHINNIKOVA 2005, 23, Fig. 14.1–9, 14; SUBBOTIN 2003, Tab. 48, 22
12	Shcherbanka 1/7	1	R	Se	R	BEYLEKCHI 1993, 63–64
13	Limanskoe 4/4	2	R	Ce	R?	IVANOVA – VETCHINNIKOVA 1993, Fig. 2.5–6
14	Starye Bilyary 1/14	3	L	Se	?	PETRENKO 1991; Subbotin 2003, Tab. 48, 4–6
15	Vapnyarka 4/16	+	R	Se	L	IVANOVA – VETCHINNOVA 2009, 47, Fig. 4.1–2
16	Kholodnaya Balka 1/15	+	?	Se	R	PETRENKO 2010, 338
17	Yasski 5/2	1	S?	Se	R	ALEKSEEVA 1976, 25–26

No.	SITE	Ex.	Position		Place	Source
	<u>Name barrow/grave</u>		R L S	Ce-Centr. Se-Second	R L Ot	
18	Petrodolinskoe 1/9	2	R	Se	R	SUBBOTIN 2003, Tab. 48, 36–37
19	Nikolaevka/Efimovka 2/23	+	R	Se	Ot	SHMAGLIY – CHERNYAKOV 1985, 100, 105, 113
20	Nikolaevka/Efimovka 6/3	+	L	Se	R?	
21	Nikolaevka/Efimovka 10/7	1	L	Se	?	
22	Novogradovka 1/4	2	?	?	?	SUBBOTIN 2003, Tab. 48, 45–46
23	Alexandrovka 1/32A	1	R	Se	?	SUBBOTIN 2003, Tab. 48, 3
24	Mereni II 1/3	6	L	Se	L	DERGACHEV – SAVA 2002, Fig. 13.4
25	Roşcani 1/13	4	L	Se	L	DERGACHEV – BORZIYAK – MANZURA 1989, Fig. 6.3; Fig. 18.1–3
26	Roşcani 5/7	3	R	Se	L	
27	Cîrnăţeni 2/10	+	L	Se	L	DEMCHENKO – LEVITSKIY 1997, 16
28	Ştefan Vodă II 1/7	4	L	Se	R	VYSOTSKIY 1992, Fig. 33.1–2
29	Slobozia-I 1/15	5	S?	Se	Ot	VYSOTSKIY 1992, Fig. 13.4
30	Slobozia-II 4/4	2	?	?	?	SUBBOTIN 2003, Tab. 47, 12–15
31	Slobozia-II 4/5	2	?	?	?	
32	Semenovka 2/2	3	L	Se	L	SUBBOTIN 2003, Tab. 48, 17, 23–27, 47–50; SUBBOTIN – RAZUMOV – SINIKA 2017, Fig. 9.8–9; Fig. 21.1–6; Fig. 56.4
33	Semenovka 8/15	4	L	Se	R	
34	Semenovka 8/16	1	L	Se	L	
35	Semenovka 19/9	1	L	Se	L	
36	Podgorodnoe-Krestovaya mogila 1/19	1	?	Se	?	GUDKOVA 1990, 61, Tab. 15, 8–9
37	Shirokoe/Alkaliya 33/3	3	L	Se	?	SUBBOTIN 2003, Tab. 48, 42–44; IVANOVA 2013a, 249, Fig. 54
38	Diviziya II 6/1	1	?	Se	?	SUBBOTIN – SAPOZHNIKOV – SUBBOTIN 2002, Fig. 7.1–2
39	Belolese 11/9	+	L	Se	L	SUBBOTIN – DZIGOVSKIY – OSTROVERKHOV 1998, 109, Fig. 42
40	Trapovka 1/11	1	?	Se	?	VANCHUGOV – ZAGINAYLO – TOSHCHEV 1976, Fig. 3.8; SUBBOTIN 1977, Tab. XVI, 9; SUBBOTIN 2003, Tab. 47, 1–6, 8
41	Trapovka 4/7	6	S	Se	Ot	
42	Liman-Zakharkina mogila 3A/30	7	R	Se	L	SUBBOTIN – TOSHCHEV 2002, Fig. 10.6–13
43	Borisovka 9/6	10	R	Se	L	SHMAGLIY – CHERNYAKOV 1970, Fig. 50.2; Fig. 64.5–14
44	Glubokoe 1/24	3	L	Se	?	SHMAGLIY – CHERNYAKOV 1970, 45, Fig. 50.2; SUBBOTIN 2003, Tab. 48, 29–31
45	Glubokoe 1/25	+	L	Se	L	
46	Artsy 1/22	2+	R	Se	L	SHMAGLIY – CHERNYAKOV – ALEKSEEVA 1972; ALEKSEEVA – BOLTRIK – SAPOZHNIKOV 2021
47	Bashtanovka 4/25	1	L	Se	?	SUBBOTIN 2003, 136, Tab. 48, 25
48	Nerushay 10/13	1	L	Se	Ot	SHMAGLIY – CHERNYAKOV 1970, 85, Fig. 64.19; SUBBOTIN 2003, Tab. 47, 9
49	Nerushay 10/14	3	L	Se	Ot	
50	Kholmskoe 2/8	2	R	Se	L	GUDKOVA – CHERNYAKOV 1981, 71, Fig. 7.4–5, 8–9; SUBBOTIN 2003, Tab. 48, 38–41
51	Kholmskoe 2/13	2	L	Se	R	
52	Kamenka 1/8	3	L	Se	?	SHMAGLIY – CHERNYAKOV – ALEKSEEVA 1970
53	Novokamenka 1/5	3	R	Se	R	SHMAGLIY – CHERNYAKOV – ALEKSEEVA 1971; SUBBOTIN 2003, Tab. 48, 32–34
54	Orlovka 1/9	2	??	Se	?	SUBBOTIN 2003, Tab. 48, 15–16

No.	SITE	Ex.	Position		Place	Source
	<u>Name barrow/grave</u>		R L S	Ce-Centr. Se-Second	R L Ot	
55	Vlădiceni I 9/2	1	L	Se	Ot	FOKEEV 1989, 9, Fig. 11.4
56	Kubey 22/18	1	S	Se	?	SUBBOTIN <i>et al.</i> 1987, Fig. 43.2; SUBBOTIN 2003, Tab. 48, 1–2
57	Kubey 23/16	1	R	Se	Ot	
58	Giurgiulești 3/13	2	?	Se	?	KHAKHEU – POPOVICH 2019, 115, Fig. 10.5–6
59	Taraclia II 14/16	2	L	Se	L	SAVA – AGULNIKOV – MANZURA 2019, Fig. 34.2–8
60	Petrești 1/3	1	?	Se	?	YAROVY 1987, Fig. 5.1–4
61	Țirpești /1	1	S	Se	R	MARINESCU-BÎLCU 1964, 241
62	Răcăciuni /?	2	?	?	?	TUDOR 1973, 283
63	Râmnicelu /10	+	L	-	?	HARȚUCHE 1973, 18–19
64	Șendreni /?	4	?	?	?	DRAGOMIR 1976, 58, Fig. 3
65	Brăilița /3	2	R	-	Ot	HARȚUCHE 2002, 46–48, 55–56
66	Brăilița /8	2	R	-	Ot	
67	Brăilița /9	1	R	-	L	
68	Brăilița /33	2	R	-	Ot	
69	Luncavița-Drumul Vacilor 1/5	1	?	Ce	?	VASILIU 1995c, 118, Pl. IV.2
70	Mihai Bravu 2/3	1	?	Ce	?	VASILIU 1995b, 145–146, Pl. VI.3
71	Gurbănești 1/2	1	S	Se	Ot	ROSETTI 1959, 793, Fig. 15.4
72	Blejoii I/1	1	R	Ce	Ot	FRÎNCULEASA <i>et al.</i> 2013, Pl. 13
73	Păulești II/2	2	S	Ce	R	FRÎNCULEASA <i>et al.</i> 2013, Pl. 8.3–7
74	Ploiești-Triaș I/2	1	?	?	?	FRÎNCULEASA <i>et al.</i> 2013, Pl. 17.4–7
75	Ploiești-Triaș I/3	2	?	?	?	
Total 75 complexes		175 ex	S-8 L-28 R-19	Se 54 Ce -6	L18 R16 Ot14	

References

AGULNIKOV, S. M. 1984

Kurgan epokhi bronzы u s. Kaplany. In: Artemenko, I. I. (red.): *Kurgany v zonakh novostroek Moldavii*. Kishinev 1984, 90–97.

AGULNIKOV, S. M. – SAVA, E. N. 2004

Issledovaniya kurganov na levoberezhie Dnestra. Kishinau 2004.

AGULNIKOV, S. M. – POPOVICH, S. S. 2009

Kurgan epokhi ranney bronzы u sela Grigorovka. *Materialy po arkheologii Severnogo Prichernomorya* 9 (2009) 156–171.

AGULNIKOV, S. – MISTREANU, E. 2014

Cercetările de salvare de la tumulul de lângă s. Brânceni Noi (r-nul Telenești). *Arheologia preventivă în Republica Moldova* I/1–2 (2014) 43–54.

AGULNIKOV, S. – MISTREANU, E. – POPOVICI, S. 2014

Tumulii de la Brânceni noi și Rogojeni (cercetări arheologice de salvare 2013). *Arheologia preventivă în Republica Moldova* I/1–2 (2014) 35–42.

ALEKSEEVA, I. L. 1971

Raskopki Belyaevskogo kurgana v 1966 godu. *Materialy po arkheologii Severnogo Prichernomorya* 7 (1971) 32–41.

ALEKSEEVA, I. L. 1992

Kurgany epokhi paleometalla v Severo-Zapadnom Prichernomore. Kyev 1992.

ALEKSEEVA, I. L. – BOLTRIK, IU.V. – SAPOZHNIKOV, I. V. 2021

Kurgan na Briennskiy gori bilya m. Artsyz. *Arkheologiya i davnya istoriya Ukraini* 2(30) (2021) 287–305.

ALEXANDRESCU, A. D. 1974

La nécropole du Bronze ancien de Zimnicea (dép. Teleorman). *Dacia N.S.* 18 (1974) 79–94.

AILINCĂI, S. – MIHAIL, F. – CAROZZA, L. – CONSTANTINESCU, M. – SOFICARU, A. – MICU, C. 2014

Une découverte funéraire de début de l'Âge de Bronze en Dobroudja (Sud-est de la Roumanie). Le tumulus de Rahman (com. Casimcea, dép. de Tulcea). *Prilozi Instituta za arheologiju u Zagrebu* 31 (2014) 73–87.

AILINCĂI, S. C. – FLORIAN, S. – CONSTANTINESCU, S. – CAROZZA, L. – MICU, C. – BURENS, A. 2016

Decouverte d'un tumulus de l'âge du bronze à Rahman sur la commune de Casimcea (dép. Tulcea). *Studii și Cercetări de Istorie Veche și Arheologie* 67/1–2 (2016) 29–52.

ANDRUKH, S. I. – DOBROLIUBSKIY, A. O. – TOSHCHEV, G. N. 1985

Kurgany u sela Plavni v nizobyakh Dunaya. Odessa 1985.

BERCIU, D. 1952

Șantierul Verbicioara. *Studii și Cercetări de Istorie Veche* 3 (1952) 163–166.

BERCIU, D. – ROMAN, P. 1984

Morminte tumulare de la Verbița (jud. Dolj). *Thraco-Dacica* 5/1–2 (1984) 15–21.

BEYLEKCHI, V. S. 1992

Raskopki kurgana 3 u s. Merkulesht. In: Ketraru, N. A. (red.): *Arkheologicheskie issledovaniya v Moldavii v 1986 z.* Kishinev 1992, 72–87.

BEYLEKCHI V. V. 1993

Kurgan u s. Shcherbanka. *Drevnosti Stepnogo Prichernomorya i Kryma* 4 (1993) 62–78.

BORZIYAK, I. A. 1984

Raskopki kurgana u st. Etulia v 1979 g. In: Artemenko I. I. (red.): *Kurgany v zonakh novostroek Moldavii*. Kishinev 1984, 75–89.

BORZIYAK, I. A. – LEVITSKIY, O. G. 1989

Issledovanie dvukh kurganov v Kriulyanskom rayone. In: Ketraru N. A. (red.): *Arkheologicheskie issledovaniya v Moldavii v 1984 gg.* Kishinev 1989, 109–127.

BORZIYAK, I. A. – MANZURA, I. V. – LEVITSKIY, O. G. 1983

Korzhevskie kurgany. In: Borziyak I. A. (red.): *Arkheologicheskie issledovaniya v Moldavii v 1979–1980 gg.* Kishinev 1983, 3–27.

BRUDIU, M. 2003

Lumea de sub tumulii din sudul Moldovei. De la indo-europeni la turanicii târzii-mărturii arheologice. București 2003.

- BUBULICH, V. G. – KHAKHEU, V. P. 2002
Issledovanie kurganov v Kamenskom rayone na Levoberezhe Srednego Dnestra. In: Ketraru, N. A. (red.): *Severnoe Prichernomorie: ot eneolita do antichnosti*. Tiraspol 2002, 112–148.
- BUZDUGAN, C. – BOBI, V. – CERNEA, N. 1987
Cercetările arheologice din tumulul 2 de la Bolotești-Vrancea. *Studii și Cercetări de Istorie Veche și Arheologie* 38/3 (1987) 224–234.
- CHEBOTARENKO, G. F. – YAROVOY, E. V. – TELNOV, N. P. 1989
Kurgany Budzhakskoy stepi. Kishinev 1989.
- CHEBOTARENKO, G. F. – TOSHCHEV, G. N. – CHERNYAKOV, I. T. 1993
Kurgany u s. Primorskoe. *Drevnosti stepnogo Prichernomor'ya i Kryma* 4 (1993) 46–62.
- CHERNYAKOV, I. T. – STANKO, V. N. – GUDKOVA, A. V. 1986
Kholm'skie kurgany. In: Stanko, V. N. (red.): *Issledovaniy po arkheologii Severo-Zapadnogo Prichernomor'ya*. Kiev 1986, 53–96.
- CIOBANU, I. – AGULNICOV, S. 2016
Investigațiile arheologice de la Crihana Veche. Rezultatele campaniei 2015. *Arheologia preventivă în Republica Moldova* III (2016) 45–60.
- CIOBANU, I. – SIMALCSIK, A. – POPOVICI, S. – AGULNICOV, S. 2019
Cercetările arheologice preventive din cadrul grupului tumular de pe drumul mare de la Giurgiulești. In: Haheu, V. (coord.): *Giurgiulești – vestigii arheologice de la Prutul Inferior*. Chișinău 2019, 119–125.
- COMAN, G. 1980
Stătornicie, continuitate. Repertoriul arheologic al județului Vaslui. București 1980.
- COMȘA, E. 1987
Mormintele cu ocră din movila I de la Glăvăneștii Vechi. *Studii și Cercetări de Istorie Veche și Arheologie* 38/4 (1987) 367–387.
- COMȘA, E. 1989
Movila II – 1949 de la Glăvăneștii Vechi. *Hierasus* 7–8 (1989) 91–103.
- DEMCHENKO, T. A. 2007
Arkheologicheskie issledovaniya kurganov Levoberezh'ya Srednego Pruta (Raskopki 1982 i 1984 gg.). *Tyraspol S.N.* 1(XVI)/1 (2007) 195–215.
- DEMCHENKO, T. A. – LEVITSKIY, O. G. 1997
Issledovaniy kurganov epokhi bronzy v Kaushanskoy rayone. In: Dergachev, V. A. (red.): *Vestigii arheologice din Moldova*. Chișinău 1997, 155–188.
- DEMCHENKO, T. A. – LEVITSKIY, O. G. 1999
Kurgan epokhi bronzy u s. Vladimirovka. *Drevnosti Stepnogo Prichernomor'ya i Kryma* 7 (1999) 133–140.
- DERGACHEV, V. A. 1973
Pamyatniki epokhi bronzy. In: Byrnya, P. P. – Ketraru, N. A. (eds.): *Arkheologicheskaya karta Moldavskoy SSR Vypusk 3*. Kishinev 1973, 66–67.
- DERGACHEV, V. A. 1975
Bronzovye predmety XIII-VIII vv. do n.e. iz Dnestrovsko-Prutskogo mezhdurech'ya. Kishinev 1975.

DERGACHEV, V. A. 1984

Kurgany u s. Gura-Bykuluy. In: Artemenko I. I. (red.): *Kurgany v zonakh novostroek Moldavii*. Kishinev 1984, 3–36.

DERGACHEV, V. A. 1986

Moldaviya i sosednie territorii v epokhu bronzy. Kishinev 1986.

DERGACHEV, V. A. 2002

Die äneolithischen und bronzezeitlichen Metallfunde aus Moldavien. Prähistorische Bronzefunde XX/9. Stuttgart 2002.

DERGACHEV, V. A. – BORZIYAK, I. A. – MANZURA, I. V. 1989

Roshkanskie kurgany. Kishinev 1989.

DERGACHEV, V. A. – MANZURA, I. V. – SAVA, E. N. 1992

Kurgany epokhi bronzy u s. Speya rayona Aneniy Noy. *Arkheologicheskie issledovaniya v Moldavii za 1986 r.* Kishinev 1992, 88–104.

DERGACHEV, V. A. – SAVA, E. N. 2002

Issledovanie kurganov v okrestnostyakh sel Mereni i Kirka. *Stratum plus* 2 (2001–2002) 526–562.

DERGACHEV, V. A. – SAVA, E. N. 2016

Issledovanie kurganov voze poselka Tarakliya v 1979 godu. In: Țerna, S. – Govedarica, B. (red.): *Kulturnye vzaimodeystviya. Dinamika I smyslu*. Kishinev 2016, 335–365.

DINU, M. 1957

Șantierul arheologic Valea Lupului. *Materiale* 3 (1957) 171–178.

DOBROVOLSKIY, V. V. 1915

Raskopki kurgana v predmeste Odessy – „Slobodka-Romanovka”. *Zapiski Odesskogo obshchestva istorii i drevnostey* 32 (1915) 123–145.

DRAGOMIR, I. 1976

Două morminte ocromane din regiunea de sud a Moldovei. *Muzeul Național* 3 (1976) 53–60.

DVORYANINOV, S. A. – DZIGOVSKIY, A. N. – SUBBOTIN, L. V. 1985

Raskopki kurganovoy gruppy u s. Vishnevoe. In: Stanko, V. N. (red.): *Novye materialy po arkheologii Severo-Zapadnogo Prichernomorya*. Kiev 1985, 132–173.

FAYFERT, A. V. 2014 (ed.)

Kurgannye pogrebeniya rannego bronzovogo veka Nizhnego Podonya (svod arkheologicheskikh istochnikov). Rostov-na-Donu 2014.

FRÎNCULEASA, A. 2007

Contribuții privind mormintele Yamnaya în Muntenia. Cercetări arheologice la Ariceștii-Rahtivani. *Țyragetia S.N.* 1(XVI)/1 (2007) 181–193.

FRÎNCULEASA, A. 2020

Endangered monuments: in rescue of the mutilated and anonymous burial mounds of the steppe. *Revista de Arheologie, Antropologie și Studii Interdisciplinare* 2 (2020) 41–79.

FRÎNCULEASA, A. – PREDA, B. – NEGREA, O. – SOFICARU, A.-D. 2013

Bronze Age tumularly graves recently investigated in Northern Wallachia. *Dacia N.S.* LVII (2013) 23–63.

- FRÎNCULEASA, A. – PREDA, B. – NICA, T. – SOFICARU, A.-D. 2014
Un nou tumul preistoric cercetat la Ariceştii Rahtivani (jud. Prahova). *Studii de Preistorie* 11 (2014) 189–227.
- FRÎNCULEASA, A. – SIMALCSIK, A. – PREDA, B. – GARVĂN, D. 2017
Smeeni-Movila Mare: monografia unui sit arheologic regăsit. Târgovişte 2017.
- FRÎNCULEASA, A. – PREDA-BĂLĂNICĂ, B. – SIMALCSIK, A. – NEGREA, O. – CONSTANTINESCU, B. – CRISTEA-STAN, D. 2019
Morminte Iamnaia într-un tumul redescoperit şi salvat în localitatea Blejoi (jud. Prahova). *Buletinul Muzeului Judeţean Teleorman. Seria Arheologie* 11 (2019) 35–78.
- GARVĂN, D. – SIMALCSIK, A. – FRÎNCULEASA, A. 2018
Complexe arheologice preistorice cercetate la Gherăseni "Grindul Cremene" (jud. Buzău) la mijlocul secolului al XX-lea. *Buletinul Muzeului judeţean Teleorman. Seria Arheologie* 10 (2018) 279–302.
- GUDKOVA, I. A. – CHERNYAKOV, I. T. 1981
Yamnye pogrebeniya s kolesami u s. Kholmokoe. *Drevnosti Severo-Zapadnogo Prichernomorya* (1981) 38–51.
- GUDKOVA, A. V. – TOSHCHEV, G. N. – CHEBOTARENKO, G. F. 1995
Kurgany u sel Kislytsa i Ozerne Odesskoy oblasti. *Drevnosti Stepnogo Prichernomorya i Kryma* 5 (1995) 91–109.
- HARAT, A. – POTUPCZYK, M. – RAZUMOV, S. 2014
Charakterystyka źródeł archeologicznych pozyskanych w latach 1984-1993. In: Kośko, A. – Potupczyk, M. – Razumov, S. (eds.): *Naddniestrzańskie kompleksy cmentarzysk kurhanowych społeczności z III i z pierwszej połowy II tysiąclecia przed Chr. w okolicach Jampola, obwód winnicki. Z badań nad północno-zachodnią rubieżą osadnictwa społeczności kręgu kultur „wczesnobrązowych” strefy pontyjskiej. Badania z lat 1984-2014*. Archaeologia Bimaris – Monografie 6. Poznań 2014, 45–204.
- HARTUCHE, N. 1973
Contribuţii la cunoaşterea epocii bronzului în judeţul Brăila. *Studii şi Cercetări de Istorie Veche* 24/1 (1973) 15–26.
- HARTUCHE, N. 2002
Complexul arheologic Brăiliţa. Bibliotheca Thracologica 35. Bucureşti 2002.
- IVANOVA, S. V. 2001
Sotsialnaya struktura naseleniya yamnoy kultury Severo-Zapadnogo Prichernomorya. Odessa 2001.
- IVANOVA, S. V. 2001–2002
Binarnye oppozitsii v pogrebalnom obryade yamnoy kultury. *Stratum plus* 2 (2001–2002) 308–316.
- IVANOVA, S. V. 2012
Ob istokakh formirovaniya budzhakskoy kultury. *Starozhytnosti Stepnogo Prichernomor'ya i Kryma* 16 (2012) 48–62.
- IVANOVA, S. V. 2013a
Yamnaya (Budzhakskaya kultura). In: Bruyako, I. V. – Samoilova, T. L. (eds.): *Drevnie kultury Severo-Zapadnogo Prichernomorya*. Odessa 2013, 211–254.

IVANOVA, S. V. 2013b

Kulturno-istoricheskie kontakty naseleniya Severo-Zapadnogo Prichernomorya v rannem bronzovom veke: Zapad-Vostok. *Stratum plus* 2 (2013) 199–257.

IVANOVA, S. 2013c

Connections between the Budzhak Culture and Central European groups of the Corded Ware Culture. *Baltic-Pontic Studies* 18 (2013) 86–120.

IVANOVA, S. V. 2014

Balkano-Karpatiskii variant Yamnoi kulturno-istoricheskoi oblasti. *Rossiyskaya arkheologiya* 2 (2014) 5–20.

IVANOVA, S. V. 2016

Prichiny i kharakter ekspansii skotovodcheskogo naseleniya v Balkano-Karpatiskiy region v rannem bronzovom veke. In: Bochkarev, V. S. – Alekshin, V. A. (ed.): *Vneshnie i vnutrennie svyazi (skotovodcheskikh) kultur Vostochnoy Evropy v eneolite i bronzovom veke (V-II tys. do n.e.)*. Sankt-Peterburg 2016, 59–64.

IVANOVA, S. V. 2020

Import abo imitatsiya: pro osoblivosti budzhaskoy kultury Pivnichno-Zakhidnogo Prychornomorya. *Arkheologiya i davnia istoriya Ukrayiny* 4/37 (2020) 182–198.

IVANOVA, S. V. – VETCHINNIKOVA, N. E. 1993

Raskopki u s. Limanskoe Razdelyanskogo rayona Odesskoy oblasti. *Drevnosti stepnogo Prichernomorya i Kryma* 4 (1993) 176–182.

IVANOVA, S. V. – VETCHINNIKOVA, N. E. 2009

Kurgan epokhi paleometalla na beregu Adzhalykского limana v Odesskoy oblasti. *Starozhytnosti Stepnogo Prichernomor'ya i Kryma* 15 (2009) 43–49.

IVANOVA, S. – TOSCHEV, G. 2015

Late Eneolithic and Bronze Age prologue Pontic societies. Forest-steppe Middle Dniester and Prut drainage basins in the 4th/3rd–2nd millennium BC: A history of investigations. In: Koško, A. (ed.): *Podolia as a Cultural Contact Area in the 4th/3rd–2nd Millennium BC*. Baltic-Pontic Studies 20. Poznań 2015, 7–39.

IVANOVA, S. V. – PETRENKO, V. G. – VETCHINNIKOVA, N. E. 2005

Kurgany drevnikh skotovodov Yuzhnogo Buga i Dniestra. Odessa 2005.

KAISER, E. 2019

Das dritte Jahrtausend im osteuropäischen Steppenraum. Kulturhistorische Studien zu prähistorischer Subsistenzwirtschaft und Interaktion mit benachbarten Räumen. Berlin Studies of the Ancient World 37. Berlin 2019.

KETRARU, N. A. – KHAKHEU, V. P. 1990

Chokyltyanskies kyrgany. In: Ketraru N. A. (red.): *Arkheologicheskie issledovaniya v Moldavii v 1985 g.* Kishinev 1990, 49–73.

KETRARU, N. A. – SINIK, V. S. – RAZUMOV, S. N. – TELNOV, N. P. 2014

Dubossarskie kurgany. Tiraspol 2014.

KETRARU, N. A. – NIKOLAEVA, N. A. – PODOLSKIY, N. L. – SAFRONOV, V. A. 1975

Kurgany u s. Starye Kukoneshty Edinetskogo r-na MSSR. *Arkheologicheskie otkrytiya 1974 goda* (1975) 438.

KHAKHEU, V. – POPOVICH, S. 2019

Raskopki kurganov u s. Zhurzuleshti v Nizhnem Poprute. In: Haheu, V. (coord.): *Giurgiulești – vestigii arheologice de la Prutul Inferior*. Chișinău 2019, 88–118.

KLEYN, L. S. 2007

Drevnie migratsii i proiskhozhdenie indo-evropeyskikh narodov. Sankt-Peterburg 2007.

KLEYN, L. S. 2016

Yamnaya, budzhakskaya i DNK. In: Bochkarev, V. S. – Alekshin, V. A. (ed.): *Vneshnie i vnutrennie svyazi (skotovodcheskikh) kultur Vostochnoy Evropy v eneolite i bronzovom veke (V-II tys. do n.e.)*. Sankt-Peterburg 2016, 6–13.

KLEYN, L. S. 2017

Yamnaya, ne yamnaya (obzor sovremennykh rabot o kurgannykh pogrebeniyakh Podunavya). *Stratum-plus* 2 (2017) 361–376.

KLOCHKO, V. – KOŚKO, A. – POTUPCZYK, M. V. – WŁODARCZAK, P. – ŻURKIEWICZ, D. – IVANOVA, S. V. 2015

Tripolye (Gordinești group), Yamnaya and Catacomb culture cemeteries, Prydnistrianske, site 1, Yampil region, Vinnitsa Oblast: archaeometric and chronometric description and a taxonomic and topogenetic discussion. *Baltic-Pontic Studies* 20 (2015) 183–255.

KORENEVSKIY, S. N. 2004

Drevneshie zemledeltsy i skotovody Predkavkazyia. Moskva 2004.

KORENEVSKIY, S. N. 2011

Drevneyshiy metall Predkavkazyia. Tipologiya. Istoriko-kulturnyy aspekt. Moskva 2011.

KOVPANENKO, G. T. – GAVRILIUK, N. A. 2004

Kurgany u ss. Novo-Iurevka i Korchino Nikolaevskoy oblasti. *Arkheologichni vidkrittia v Ukraini v 2002-2003 rr.* 6 (2004) 373–383.

LARINA, O. – MANZURA, I. – KHAKHEU, V. 2008

Brevichenskie kurgany. Kishinev 2008.

LEVINSKIY, A. N. – TENTYUK, I. S. 1990

Issledovanie kurganov u s. Merculeshty. In: Dergacev V. A. (red.): *Arkheologicheskie issledovaniya molodykh uchenykh Moldavii*. Kishinev: Shtiintsa 1990, 93–100.

LEVITSKIY, O. G. 1988

Kurgan epokhi bronzы u s. Tomay. In: Chebotarenko, G. F. (red.): *Arkheologicheskie issledovaniya v Moldavii 1983 g.* Kishinev 1988, 35–44.

LEVIȚKI, O. – MANZURA, I. – DEMCHENKO, T. 1996

Necropola tumulară de la Sărăteni. Biblioteca Thracologica XVII. București 1996.

MALIUKOVICH, A. E. – AGULNIKOV, S. M. – POPOVICH, S. S. 2017

Kurgany pravoberezhya Dnestrovskogo limana u s. Mologa. Odessa, Kishinev 2017.

MANZURA, I. V. 1984

Issledovanie kurganov u pos. Svetlyy. In: Artemenko, I. I. (red.): *Kurgany v zonakh novostroek Moldavii*. Kishinev: Shtiintsa (1984) 109–142.

MANZURA, I. V. – KLOCHKO, E. O. – SAVVA, E. N. 1992

Kamenskie kurgany. Kishinev: Shtiintsa 1992.

MARINESCU-BÎLCU, S. 1964

Unele probleme ale perioadei de tranziție de la neolitic la epoca bronzului din Moldova în lumina a trei morminte plane de înhumatie descoperite la Tîrpești. *Studii și Cercetări de Istorie Veche* 15/2 (1964) 241–250.

MELIUKOVA, A. I. 1962

Kurgan usatovskogo tipa u s. Tudora. *Kratkie soobshcheniya Instituta arkheologii AN SSSR* 88 (1962) 74–83.

MERPERT, N. YA. 1968

Drevnaishaya istoriya naseleniya stepnoi polosy Vostochnoi Evropy (III – nachalo II tys. do n.e.). Moskva 1968.

MERPERT, N. YA. 1974

Drevneishie skotovody Volgo-Uralskogo mezhdurechia. Moskva 1974.

MORINTZ, S. – ȘERBĂNESCU, D. 1974

Cercetări arheologice la Hârșova și împrejurimi. *Studii și Cercetări de Istorie Veche* 25/1 (1974) 47–69.

MUNCHAEV, R. M. 1994

Maykopskaya kul'tura. In: Kushnareva, K. Kh. – Markovin, V. I. (eds): *Epokha Bronzy Kavkaza i Srednei Azii: Rannyya i Srednyaya Bronza Kavkaza*. Moskva 1994, 158–225.

NIKOLAEVA, N. A. – SAFRONOV, V. A. 1976

Kurgany u s. Dumeany Ryshkanovskogo rajona. Arkheologicheskie otkrytiya 1975 goda (1976) 472–473.

PATOKOVA, E. F. 1979

Usatovskoe poselenie i mogilniki. Kiev 1979.

PETRENKO, S. V. 1991

Kurgan bronzovogo veka u s. Starye Bilyary. In: Vanchugov, V. P. – Zaginaylo, A. G. – Kushnir, V. G. – Petrenko V. G. (eds.): *Antonovka II. Poselenie pozdnego bronzovogo veka v Severo-Zapadnom Prichernomore*. Kyev 1991, 77–91.

PETRENKO, S. V. 2010

Kurgan epokhi paleometalla na poberezhe Khdzhibeyskogo limana. *Materialy po arkheologii Severnogo Prichernomor'ya* 11 (2010) 302–366.

PETRESCU-DÎMBOVIȚA, M. 1950

Date noi asupra înmormântărilor cu ocră roșu în Moldova. *Studii și Cercetări de Istorie Veche* 1/2 (1950) 110–125.

RASSAMAKIN, Y. Y. 2004

Die nordpontische Steppe in der Kupferzeit. Gräber aus der Mitte des 5. Jts. bis Ende des 4. Jts. v. Chr. Archäologie in Eurasien 17. Mainz am Rhein 2004.

RAZUMOV, S. N. – LYSENKO, S. D. – SINIK, V. S. – TELNOV, N. P. – CHETVETIKOV, I. A. 2013

Kurgany epokhi bronzы u s. Glinoe na levoberezhie Nizhnego Dnestra. *Stratum plus* 2 (2013) 297–340.

REZEPKIN, A. D. 2012

Novosvobodnenskaya kultura (na osnove materialov mogilnika Klady). St. Peterburg 2012.

ROSETTI, D. V. 1959

Movilele funerare de la Gurbănești (r. Lehliu, reg. București). *Materiale și Cercetări Arheologice* 6 (1959) 791–816.

SAVA, E. N. 1988

Issledovaniya kurgana u g. Tiraspol. In: Chebotarenko, G. F. (red.): *Arkheologicheskie issledovaniya v Moldavii 1983* (1988) 44–59.

SAVA, E. – AGULNIKOV, S. – MANZURA, I. 2019

Issledovaniya kurganov v Budžakskoj stepi (1980–1985 gg.). Biblioteca Tyrageia 30. Kishinev 2019.

SEROVA, N. L. – YAROVY, E. N. 1987

Grigoropolskie kurgany. Kishinev 1987.

SHAPOSHNIKOVA, O. G. – FOMENKO, V. N. – DOVZHENKO, N. D. 1986

Yamnaya kulturno-istoricheskaya oblast (yuzhnobugskiy variant). Svod arkheologicheskikh istochnikov VI-3. Kiev 1986.

SHCHERBAKOVA, T. A. – TASHCHI, E. F. – TELNOV, N. P. 2008

Kochevnicheskie drevnosti Nizhnego Podnestrodyia (po materialam raskopok y g. Slobozia). Kishinev 2008.

SHMAGLIY, N. M. – CHERNYAKOV, I. T. 1970

Kurgany stepnoy chasti mezhdurechiya Dunay i Dnestra (1964–1966 gg.). *Materialy po arkheologii Severnogo Prichernomorya* 6 (1970) 5–115.

SHMAGLIY, N. M. – CHERNYAKOV, I. T. 1985

Kurgany na levoberezhie Nizhnego Dnestra. In: Stanko, V. N. (red.): *Novye materialy po arkheologii Severo-Zapadnogo Prichernomorya*. Kiev 1985, 95–131.

SIMION, G. 2003

Culturi antice în zona gurilor Dunării. Vol. I: *Preistorie și protoistorie*. Biblioteca Istro-Pontica, Seria Arheologie 5. Constanța 2003.

SINIKA, V. S. – RAZUMOV, S. N. – TELNOV, N. P. 2013

Kurgany u sela Butor. Tiraspol: Piligrafist 2013.

SINIKA, V. S. – RAZUMOV, S. N. – LYSENKO, S. D. – TELNOV, N. P. 2015

Kurgannaya grupa "Sputnik" u s. Blizhniy Khutor na levoberezhie Nizhnego Dnestra. *Materialy po arkheologii Severnogo Prichernomorya* 13 (2015) 164–194.

SINIUK, A. T. 1983

Kurgany epokhi bronzы Srednego Dona. Pavlovskiy kurgan. Voronezh: Izdatelstvo Voronezhskogo Universiteta 1983.

STÖLLNER, T. 2016

The Beginnings of Social Inequality: Consumer and Producer Perspectives from Transcaucasia in the 4th and the 3rd Millennia BC. In: Bartelheim, M. – Horejs, B. – Krauß, R. (Hrsg.): *Von Baden bis Troia. Ressourcennutzung, Metallurgie und Wissenstransfer. Eine Jubiläumsschrift für Ernst Pernicka*. Oriental and European archaeology III. Rahden/Westf.: Verlag Marie Leidorf GmbH 2016, 209–234.

SUBBOTIN, L. V. 1982

Dva kurgana epokhi bronzы v Bugo-Dnestrovskom mezhdurechie. In: Dzis-Rayko, G. A. (red.): *Arkheologicheskie pamyatniki Severo-Zapadnogo Prichenomorya*. Kyev 1982, 100–110.

SUBBOTIN, L. V. 1988

Megaliticheskoe pogrebenie u s. Tatarbunary. In: Shaposhnikova, O. G. (red.): *Novye pamyatniki yamnoy kultury stepnoy zony Ukrainy*. Kiev: Naukova dumka 1988, 124–130.

SUBBOTIN, L. V. 2000

Severo-zapadnoe prichernomorie v epohu rannej i srednej bronzy. *Stratum plus* 2 (2000) 350–387.

SUBBOTIN, L. V. 2003

Orudiya truda, oruzhie i ukrasheniya plemen yamnoj kultury Severo-Zapadnogo-Prichernomorya. Materialy po arkheologii Ukrainy 1. Odessa 2003.

SUBBOTIN, L. V. – SHMAGLIY, N. M. 1970

Bolgradskiy kurganyy mogilnik. *Materialy po arkheologii Severnogo Prichernomorya* 6 (1970) 116–129.

SUBBOTIN, L. V. – TOSHCHEV, G. N. 2002

Arkheologicheskie drevnosti Budzhaka. Kurgannaya gruppa u s. Liman. Odessa 2002.

SUBBOTIN, L. V. – ZAGINAYLO, A. G. – SHMAGLIY, N. M. 1970

Kurgany u s. Ogorodnoe. *Materialy po arkheologii Severnogo Prichernomorya* 6 (1970) 130–155.

SUBBOTIN, L. V. – OSTROVERKHOV, A. S. – DZIGOVSKIY, A. N. 1995

Arkheologicheskie drevnosti Budzhaka. Kurgany vostochnogo poberezhya ozera Sasyk. Odessa 1995.

SUBBOTIN, L. V. – DZIGOVSKIY, A. N. – OSTROVERKHOV, A. S. 1998

Arkheologicheskie drevnosti Budzhaka. Kurgany u cel Vishnevoe i Belolese. Odessa 1998.

SUBBOTIN, L. V. – SAPOZHNIKOV, I. V. – SUBBOTIN, A. V. 2002

Kurganny mogilnik Diviziya II v mezhdureche Khadzhideera i Alkaliya. *Stratum plus* 2 (2002) 563–581.

SUBBOTIN, L. V. – RAZUMOV, S. N. – SINIKA, V. S. 2017

Semenovskie kurgany. Tiraspol 2017.

ȘERBĂNESCU, D. – COMȘA, A. 2012

The Yamnaya burials from Sultana, in the context of the similar finds on the territory of Romania. In: Sîrbu, V. – Schuster, C. (ed.): *Tumuli Graves – Status Symbol of the Dead in the Bronze and Iron Ages in Europe*. British Archaeological Reports 2396 (2012) 23–27.

TOSHCHEV, G. N. 1992

Kurgany epokhi bronzy mezhazerya Yalpuga i Kagula. Zaporozhe: Zaporozhskiy gosudarstvennyy universitet 1992.

TUDOR, E. 1973

Un mormînt de la începutul epocii bronzului descoperit la Răcăciuni (județul Bacău). *Studii și Cercetări de Istorie Veche* 24/2 (1973) 283–289.

VANCHUGOV, V. P. – ZAGINAYLO, A. G. – TOSHCHEV, G. N. 1976

Okhrannyeraskopki kurgana u s. Trapovka Odesskoy oblasti. In: *Arheologicheskie i arkheograficheskie issledovaniya na territorii Iuzhnoy Ukrainy*. Odessa 1976, 214–224.

VASILIU, I. 1995a

Cercetări arheologice în Delta Dunării. Mormintele cu ocră de la Chilia Veche. *Peuce* 11 (1995) 49–87.

VASILIU, I. 1995b

Date noi privind înmormântările cu ocră din Dobrogea. Mămile funerare de la Mihai Bravu. *Peuce* 11 (1995) 141–175.

VASILIU, I. 1995c

Noi informații privind epoca bronzului în nordul Dobrogei. Mămile funerare de la Luncavița, punctul Drumul Vacilor. *Peuce* 11 (1995) 117–141.

YAROVOY, E. V. 1983

Kurgan epokhi bronzы u s. Yablona. In: Borziyak, I. A. (red.): *Arkheologicheskie issledovaniya v Moldavii v 1979–1980 gg.* Kishinev 1983, 193–210.

YAROVOY, E. V. 1984

Pogrebalnyy obryad nekotorykh skotovodcheskikh plemen Srednego Pruta (po materialam raskopok kurganov u s. Korpach). In: Artemeno, I. I. (red.): *Kurgany v zonakh novostroek Moldavii.* Kishinev 1984, 37–75.

YAROVOY, E. V. 1985

Drevnejshie skotovodcheskie plemena Yugo-Zapada SSSR (klassifikatsiya pogrebalnogo obriada). Kishinev 1985.

YAROVOY, E. V. 1990

Kurgany eneolita – bronzы Nizhnego Podnestrovyia. Kishinev 1990.

ZAGINAYLO, A. G. – CHERNYAKOV, I. T. – PETRENKO, V. G. 1987

Karolino-Bugazkiy mogilnik. In: Samoylova, T. L. (red.): *Novye issledovaniya po arkheologii Severnogo Prichernomor'ya.* Kiev 1987, 99–108.

ZAHARIA, E. 1959

Die Lockenringe von Sărata-Monteoru und ihre typologischen und chronologischen Beziehungen. *Dacia N.S.* 3 (1959) 103–134.

Archival materials

AGULNIKOV, S. M. 1992

Otchet o polevykh issledovaniyakh Kagul'skoy novostrochnoy arkheologicheskoy ekspeditsii u s. Manta i Gavanoasa v 1991 g. Arkhiv Natsionalnogo Muzeia Istarii Moldovy 1992/342. Kishinev 1992.

AGULNIKOV, S. M. – ANTIPENKO, E. O. 1990

Otchet o polevykh issledovaniyakh Suvorovskoy novostrochnoy arkheologicheskoy ekspeditsii v 1989 g. Arkhiv Natsionalnogo Muzeia Istarii Moldovy 1990/297. Kishinev 1990.

ALEKSEEVA, I. L. 1973

Otchet o rabote Dnestro-Dunayskoy (novostrochnoy) ekspeditsii OAM AN USSR po raskopkam kurganov v zone stroitelstva Nizhnednestrovskoy orositel'noy sistemy (ss. Sanzheyka, Dobroalexandrovka, Petrodolinskoe, Ovidiopolskogo r-na Odesskoy obl.) v 1973 g. Arkhiv OAM 1973/№ 87480. Odessa 1973.

ALEKSEEVA, I. L. 1974

Otchet o raskopkakh kurganov Dnestro-Dunayskoy arheologicheskoy (novostrochnoy) ekspeditsii Odesskogo arkheologicheskogo muzeia Akademii nauk USSSR v zone stroitelstva Chervonoyarskoy orositel'noy sistemy (ss. Desantnoe, Mirnoe, Shevchenkovo, Chervonyy Yar Kiliyskogo rayona Odesskoy oblasti) v 1974 g. Arkhiv Instituta Arkheologii Natsionalnoy Akademii Nauk Ukrainy 1974/62. Kiev 1974.

ALEKSEEVA, I. L. 1976

Otchet o raskopkakh kurganov Nizhne-Dnestrovskoi (novostrochnoy) ekspeditsii IA AN USSR v zone stroitelstva I очереди Nizhne-Dnestrovskoi orositel'noy sistemy (s. Yasski, Bekyaevskogo ra-

a, *Odesskoy obl., s/kh «Druzhba narodov»*). Arkhiv Instituta Arkheologii Natsionalnoy Akademii Nauk Ukrainy 1976/87. Kiev 1976.

ALEKSEEVA, I. L. 1979

Otchet o rabote Bugo-Dnestrovskoy novostroechnoy ekspeditsii IA AN USSR po raskopkam kurganov v zone II ocheredi Nizhnednestrovskoy orositelnoy sistemy (ss. Dalnik, Mirnoe Belyaevskogo rayona, s. Novaya Dolina Ovidiopolskogo rayona Odesskoy oblasti) v 1979 g. Arkhiv Instituta Arkheologii Natsionalnoy Akademii Nauk Ukrainy 1979/1. Kiev 1979.

CHERNYAKOV, I. T. – DOBROVOLSKIY, A. O. – OSTROVERKHOV, A. S. – DZIGOVSKIY, A. N. – SHAPOSHNIKOV, I. V. – CHERNOV, S. I. et al. 1982

Otchet ob okhrannykh raskopkakh kurganov v zone stroitelstva Dunay-Dnestrovskoy OS i Odesskoy ATETS za 1982 g. Arkhiv Instituta Arkheologii Natsionalnoy Akademii Nauk Ukrainy 1982/7. Kiev 1982.

CHERNYAKOV, I. T. – DZIGOVSKIY, A. N. – OSTROVERKHOV, A. S. – CHERNOV, S. I. – IVANOVA, S. V. – SOLETZKIY, V. M. et al. 1983

Otchet o rabote Bugo-Dnestrovskoy novostroechnoy ekspeditsii v 1983 g. Arkhiv Instituta Arkheologii Natsionalnoy Akademii Nauk Ukrainy 1983/13. Kiev 1983.

CHIRKOV, A. I. 1989

Otchet o polevykh issledovaniyakh Edinetskogo otryada Prutskoy novostroechnoy arkheologicheskoy ekspeditsii v 1989 g. Arkhiv Natsionalnogo Muzeia Istorii Moldovy 1989/310. Kishinev 1989.

FOKEEV, M. M. 1989

Otchet o raskopkakh Vladychenskoy ekspeditsii: mogilnik Vladycheni-I (1989 g.). Arkhiv Instituta Arkheologii Natsionalnoy Akademii Nauk Ukrainy 1989/51. Kiev 1989.

GUDKOVA, A. V. 1990

Otchet o rabote Budzhakskoy arkheologicheskoy ekspeditsii o raskopkakh cherykhovskogo mogilnika Nagornoe II v Reniyskom rayone, raskopkakh v Belgorod-Dnestrovskom rayone kurgannoy gruppy Babey, kurgany Krestovaya mogila u s. Podgorodnoe I mnogoslennogo poseleniy Roshchea za 1990 g. Arkhiv Instituta Arkheologii Natsionalnoy Akademii Nauk Ukrainy 1990/266. Kiev 1990.

GUDKOVA, A. V. – DOBROLIUBSKIY, A. O. – TOSHCHEV, G. N. – FOKEEV, M. M. 1979

Otchet o rabote Izmailskoy novostroechnoy ekspeditsii Instituta arkheologii AN USSR v 1979 godu. Arkhiv Instituta Arkheologii Natsionalnoy Akademii Nauk Ukrainy 1979/5. Kiev 1979.

GUDKOVA, A. V. – DOBROLIUBSKIY, A. O. – TOSHCHEV, G. N. – FOKEEV, M. M. 1981

Otchet o rabote Izmailskoy novostroechnoy ekspeditsii Instituta arkheologii AN USSR v 1981 godu. Arkhiv Instituta Arkheologii Natsionalnoy Akademii Nauk Ukrainy 1981/1. Kiev 1981.

GUDKOVA, A. V. – TOSHCHEV, G. N. – FOKEEV, M. M. – ANDRUKH, S. I. 1984

Otchet o rabote Izmailskoy novostroechnoy ekspeditsii v 1984 g. Arkhiv Instituta Arkheologii Natsionalnoy Akademii Nauk Ukrainy 1984/158. Kiev 1984.

PETRENKO, S. V. 2007

Otchet Pridnestrovskoy ekspeditsii o raskopkakh v 2006 g. vtorogo Belyaevskogo kurganakurgana. Odessa 2007.

SHCHERBAKOVA, T. A. – KASHUBA, M. T. 1991

Otchet o polevykh issledovaniyakh Rybnitskoy novostroechnoy arkheologicheskoy ekspeditsii v 1990 g. (raskopki kurganov u s. Mokra Rybnitskogo rayona MSSR). Arkhiv Natsionalnogo Muzeia Istorii Moldovy 1991/ 322. Kishinev 1991.

SHMAGLIY, N. M. – CHERNYAKOV, I. T. – ALEKSEEVA, I. L. 1970

Otchet ob raskopkakh kurganov Dnestrovsko-Dunayskoy (novostroechnoy) ekspeditsii Instituta arkheologii AN USSR i Odesskogo arkheologicheskogo mezeya AN USSR v zone stroitelstva Sovorovskoy orositelnoy sistemy v 1970 g. (ss. Suvorovo, Utkonosovka, Kamenka, Novokamenka Izmailskogo rayona). Arkhiv Instituta Arkheologii Natsionalnoy Akademii Nauk Ukrainy 1970/40. Kiev 1970.

SHMAGLIY, N. M. – CHERNYAKOV, I. T. – ALEKSEEVA, I. L. 1971

Otchet o rabote Dnestro-Dunayskoy (novostroechnoy) ekspeditsii Instituta arkheologii AN USSR i Odesskogo arkheologicheskogo mezeya AN USSR za 1971 g. Arkhiv Instituta Arkheologii Natsionalnoy Akademii Nauk Ukrainy 1971/26. Kiev 1971.

SHMAGLIY, N. M. – CHERNYAKOV, I. T. – ALEKSEEVA, I. L. 1972

Otchet o raskopkakh Dnestro-Dunayskoy ekspeditsii IA AN USSR i OAM za 1972 z. Arkhiv Instituta Arkheologii Natsionalnoy Akademii Nauk Ukrainy 1972/14. Kiev 1972.

SUBBOTIN, L. V. 1977

Otchet o raskopkakh kurganov Dunay-Dnestrovskoy novostroechnoy ekspeditsii v 1977 g. Arkhiv Instituta Arkheologii Natsionalnoy Akademii Nauk Ukrainy 1977/131. Kiev 1977.

SUBBOTIN, L. V. – OSTROVERKHOV, A. S. – DZIGOVSKIY, A. N. – CHERNOV, S. I. 1981

Otchet o rabote Dunay-Dnestrovskoy novostroechnoy ekspeditsii IA AN USSR v 1981 godu. Arkhiv Instituta Arkheologii Natsionalnoy Akademii Nauk Ukrainy 1981/7. Kiev 1981.

SUBBOTIN, L. V. – DZIGOVSKIY, A. N. – FOKEEV, M. M. – SAPOZHNIKOV, I. V. 1987

Otchet o rabote Dunay-Dnestrovskoy novostroechnoy ekspeditsii IA AN USSR v 1987 godu. Arkhiv Instituta Arkheologii Natsionalnoy Akademii Nauk Ukrainy 1987/24. Kiev 1987.

TELNOV, N. P. – SINIKA, V. S. – RAZUMOV, S. N. – LYSENKO, S. D. 2013

Polevoy otchet o rabotakh Dnestrovskoy arkheologicheskoy ekspeditsii u s. Glinoe Slobodzeyskogo rayona v 2013 godu. Tiraspol 2013.

VYSOTSKIY, A. L. 1992

Otchet o polevykh issledovaniyakh Suvorovskoy novostroechnoy arkheologicheskoy ekspeditsii v 1991 z. Arkhiv Natsionalnogo Muzeya Istorii Moldovy 1992/332. Kishinev 1992.

YAROVOY, E. V. 1978

Otchet o polevykh issledovaniyakh eneoliticheskoy arkheologicheskoy ekspeditsii v 1977 godu. Arkhiv Natsionalnogo Muzeya Istorii Moldovy 1978/124. Kishinev 1978.

YAROVOY, E. V. 1987

Otchet o rabotakh Prutsoy novostroechnoy ekspeditsii v 1986 g. Arkhiv Natsionalnogo Muzeya Istorii Moldovy 1987/252. Kishinev 1987.

YAROVOY, E. V. 2010

Otchet o polevykh issledovaniyakh Brichanskogo otryada Prutsoy novostroechnoy arkheologicheskoy ekspeditsii v 1989 g. Arkhiv Natsionalnogo Muzeya Istorii Moldovy 515. Moskva 2010.

YAROVOY, E. V. – SAVVA, E. N. 1983

Otchet o polevykh issledovaniyakh Slobozeyiskoy novostroechnoy arkheologicheskoy ekspeditsii v 1982 g. Arkhiv Natsionalnogo Muzeya Istorii Moldovy N178. Kishinev 1983.

YAROVOY, E. V. – CHIRKOV, A. IU. 1987

Otchet o polevykh issledovaniyakh Prutskoy novostroechnoy arkheologicheskoy ekspeditsii v 1987 godu. Arkhiv Natsionalnogo Muzeya Istorii Moldovy 1987/261. Kishinev 1987.

YAROVOY, E. V. – CHIRKOV, A. IU. 1989

Otchet o polevykh issledovaniyakh Putskoy novostroechnoy arkheologicheskoy expedititsii v 1988 g.
Arkhir Natsionalnogo Muzeya Istorii Moldovy 1989/287. Kishinev 1989.

YAROVOY, E. V. – CHIRKOV, A. YU. – BUBULICH, V. G. 1990

Otchet o polevykh issledovaniyakh Putskoy novostroechnoy arkheologicheskoy expedititsii v 1990 g.
Arkhir Natsionalnogo Muzeya Istorii Moldovy N323. Kishinev 1990.

The Bronze Age mounds from Aliman (Constanța County, Romania)

CRISTIAN EDUARD ȘTEFAN – GABRIEL VASILE – RADU PETCU – ANDREI HEROIU –
BIANCA PREDA-BĂLĂNICĂ – MARTIN TRAUTMANN

Abstract

During a rescue excavation in 2019 two Bronze Age mounds were investigated in Aliman (Constanța County). One of them was 28×21 m in diameter, ca. 1 m in height and contained two graves (T3). The other one was 22 m in diameter, ca. 1.40 m in height with a circular ditch and contained four graves (T4). At a distance of ca. 25 m south-east of the first mound (T3), an isolated grave was discovered. The earliest burial dates from the last third of the 4th millennium BC, several others from different phases of the first half of the 3rd millennium BC and, finally, the last one was added in the 2nd millennium BC. In this article, taking as a starting point the archaeological, bio-anthropological and radiocarbon research of the graves, we discuss the absolute chronology of more than one and a half millennia of burial mounds use in Dobroudja and the transformation of burial practices in this interval. Our results correlate with finds from burial mounds investigated in eastern and southern Romania, but also the wider steppe-like regions of Hungary, Bulgaria and Serbia.

Key words: Dobroudja, Bronze Age, burial mounds, absolute chronology, burial practices

Introduction

In the summer of 2019, due to a contract between the Museum of National History and Archaeology from Constanța and a private beneficiary, an archaeological excavation was carried out on a terrain located on the territory of Aliman commune, Constanța County (*Pl. 1*), respectively on the plots A 815/58, A 815/59, A 815/60, Plot 2, where the construction of a winery with several utility annexes was planned. The land is located in the southwestern part of Aliman (at a distance of about 2 km from the town centre), on a hill, known topographically as *Dealul Macului*, near the road DJ 223, which connects Aliman and Floriile (*Pl. 2*).

The territory of Aliman community is known for the density of archaeological sites, due to its location in an area favourable to habitation, located near the Danube and crossed by wide and deep valleys. We mention here the fortress of Sacidava, an important fortification of the Danube *limes* in Roman times (SCORPAN 1973, 267–331; 1978, 155–180; COLESNIUC *et al.* 2020, 375–384); the strong fortified Getic centre from Adâncata-Floriile (IRIMIA 1983, 91–92; 1999, 71–82; 2004–2005, 319–384; 2007, 149–153; TALMAȚCHI 1994, 231–233; VERTAN – CUSTUREA 1995–1996, 315); a Getic cremation grave discovered in the summer of 1972 in the centre of Aliman, dated in the 2nd–3rd century AD (SCORPAN 1974, 239–246), as well as traces of early medieval dwellings dating to the 10th–11th centuries AD (PAPASIMA – CHERA 1999, 289; MUNTEANU – OPREA 2007, 513).

Our study area is listed in the List of Historical Monuments from 2015 (LMI - Lista Monumentelor Istorice) as the archaeological site “*Tumuli, Aliman village, Aliman commune*” (CT-IsA-20171, vaguely located “within the perimeter of the entire commune” and dated in “2nd–3rd century AD, Roman times”);

under the same name and location, the site is also present in the National Archaeological Repertory (RAN - Repertoriul Arheologic Național code 61014.01) under the name “*Aliman Mounds*”.

Archaeological finds

Preliminary surface investigations, corroborated with the information obtained from the study of archive images, allowed the identification on the site of the future winery of two flattened mounds, which are part of a series of eight mounds found on *Dealul Macului*. The mounds were slightly visible on the ground level due to the natural erosion, ploughing, being also affected by a grapery in the 1980s. The mounds were named T1–T8, the numbering starting from North to South (*Pl. 2–3*). Four of them appear on the Artillery Firing Plans of the early twentieth century (*Pl. 2.2*). For the most accurate registration of the protection perimeters of the two existing mounds on the beneficiary's land (T3 and T4), a topographic survey was carried out. Archaeological documentation was supplemented by an intrusive diagnosis, in order to record any funerary features or ditches outside the excavated perimeter. Excavation was carried out in rectangular sections, with stratigraphic controls on the N-S and E-W directions, by pickling with mechanical equipment in different stages and by successive manual scraping, down to the yellow loess layer (1.00/1.10 m below the present surface level) (*Pl. 4*). Regarding the stratigraphy, just under the modern humus layer with a thickness of 0.40/0.50 m there was a sterile brown soil layer with a thickness of 0.40/0.50 m, this being followed by the yellow, sterile soil, observed at 1.00/1.10 m below the current surface level.

Tumulus 3

The tumulus (mound) had an oval shape, being of medium size (28×21 m) (*Pl. 4*). The maximum preserved height was about 1 m and it was strongly flattened, due to the intensive agricultural works carried out in the area in the last decades. The excavation consisted of the marking of four sectors, thus obtaining two main cross-shaped stratigraphic controls, in the East-West and North-South directions. Following the stratigraphic observations, it was possible to document the mound construction: the mantle consists of yellow clay extracted from the margins of the mound, especially from its southern and southeastern parts. It was built directly over the yellow, sterile soil, which indicates a previous cleaning of the ancient humus (*Pl. 5*). The sectors were numbered from one to four clockwise. In Sector 1, located in the northeast, two burials were identified; no archaeological features were found in the other three.

T3/Grave 1 – Inhumation burial in a simple pit, the primary grave of the mound. The deceased was placed in extended position, with arms stretched along the body and the chin towards the chest. The orientation of the skeleton was NE-SW (*Pl. 6.2–3*). The pit was oval-shaped (1.80×1.50 m), its outline was identified at -1.10 m and the pit bottom reached -1.40 m (*Pl. 6.1*). Traces of red ochre were observed on the bottom of the pit. The structural preservation of the bones is firm, completeness is around 50%, with the right hand, the left arm and the rib cage missing. No grave goods were found. Anthropological determination: indeterminate; 7.0 years ± 24 months.

T3/Grave 2 – Double inhumation burial in a simple pit, as secondary grave dug into the mantle of the mound. The deceased (Individual 1) was placed in supine position, with arms stretched along the body, slightly bent towards the pelvis, and legs fallen to the right side. The orientation of the skeleton was E-W, and facing north (*Pl. 7.2–3*). The pit was rectangular with rounded corners (1.60×1.30 m) (*Pl. 7.1*). The outline of the pit was identified at -1.25 m and the pit bottom reached -1.40 m. South of Individual 1, near the left elbow, a child skull (Individual 2) was found, in a very precarious state of preservation. It probably belonged to a newborn, who was buried with the adult. The adult was sprinkled with red ochre,

the lumps being identified as reddish spots on the bottom of the pit, on the north and west sides of the grave, as well as next to the deceased. As grave good, a clay vessel was placed in the southeastern corner of the pit. The vessel is an askoidal jug with a raised handle. The jug has a coarse paste, tempered with sand and chalk fragments. The outside part of the vessel has grey areas and the interior is brown-reddish. No decoration was observed, its state of preservation being precarious: the bottom and the upper side are missing (*Pl. 7.4*). Preserved dimensions: 11 cm in height, 11.5 cm maximum diameter. Anthropological determination: Individual 1: male; 18.5–39.4 years; Individual 2: indeterminate, 0.0–1.0 years.

Tumulus 4

Mound of medium size, circular in shape, with a diameter of 22 m (*Pl. 4*). The maximum height preserved was about 1.40 m. Positioned close to mound T3, it was flattened by intensive agricultural works made in the area. The research method approached was similar to the one used at T3, namely excavating four sectors numbered from one to four clockwise. Following the information provided by the two main stratigraphic controls (North-South and East-West oriented), two phases of tumulus construction were identified (*Pl. 8*):

- In the first phase, the funerary arrangement was small and corresponded to Gr.2. The grave was surrounded by an enclosing ditch conventionally named C1 (the outline was identified at -1.20 m, the final depth was -1.50 m and the width 0.60 m). The ditch was partially documented in its eastern half, where it was dug deeper in the yellow, sterile soil (*Pl. 11.2*). In the western half its trajectory was visible on the spot, then gradually climbed and got lost in the modern humus. Its northwestern part could not be identified at all. In the North-East area the ditch had a gap, which probably marked the entrance. The surface delimited by C1 feature has a diameter of ca. 10.50 m, which would indicate the size of the mound in this phase. Much of the C1 feature as well as Gr.2 are in Sectors 1 and 4.
- The second phase corresponds to Gr.1, Gr.3 and Gr.4. Gr.1 intersects C1 ditch and is placed eastwards of Gr.2. The pit of Gr.4 overlaps the C1 ditch and is located south of Gr.2. In this phase, we are witnessing an increase in size of the mound mainly to the south and southeast areas. Concerning the building method, the mantle was placed directly on the sterile soil and was made by ancient humus mixed with yellow, sterile clay. A clay extraction area for this purpose was documented nearby, in Sector 1. It was outlined in a form of a very shallow and poorly preserved *in situ* ditch (probably due to the modern interventions in the area).

T4/Grave 1 – Inhumation burial in a simple pit. The grave overlaps the C1 ditch (*Pl. 9.1*). The deceased was laid on the back, slightly tilted to the right side. The left arm was flexed, right arm being stretched along the body, the legs are flexed on the right side. The skeleton's orientation is N-S, and facing west (*Pl. 9.2–3*). The pit had a rectangular shape with rounded corners (1.90×1.20 m), the outline was identified at -1.20 m and the pit bottom reached -1.55 m. No grave goods were found. Anthropological determination: indeterminate, 12.0–14.0 years.

T4/Grave 2 – Inhumation burial in a simple pit. The deceased was placed in supine position with the arms along the body, and the legs initially with raised knees that have subsequently fallen to the left side. The orientation of the skeleton is NE-SW (*Pl. 10.1–2*). The pit shape is rectangular with rounded corners (1.75×1.00 m), its outline was identified at a depth of -1.25 m and the pit bottom reached -1.60 m. The grave was surrounded by a circular ditch. The bones were in a very good state of preservation. The head was propped up and slightly raised on a yellow clay mixed with black soil "pillow". No grave goods were found. Anthropological determination: indeterminate, 14.0–18.0 years.

T4/Grave 3 – Inhumation burial in a simple pit. The grave was found in the stratigraphic control between Sectors 2 and 3, its shallow pit being observed in the mantle of the mound. The position of the deceased was crouched on the left side. The orientation of the skeleton is NE-SW (*Pl. 10.3–5*). The burial was destroyed by modern interventions, leaving only the individual's pelvis and legs. The pit outline was identified at -1.00 m and the pit bottom reached -1.25 m. No grave goods were found. Anthropological determination: male, 27.1–32.0 years.

T4/Grave 4 – Inhumation burial in a simple pit. The grave pit was dug in the C1 ditch but did not reach its bottom (*Pl. 11.3*). The deceased laid in supine position, with legs bent to the left. The preservation state of the bones is very precarious: a few skull fragments, a few ribs, left hand and parts of legs remained. The orientation of the skeleton is W-E (*Pl. 11.1*). The outline of the pit was identified at -1.15 m and the pit bottom reached -1.20 m. No grave goods were found. Anthropological determination: indeterminate, 3.0 years $\pm$ 12 months.

The flat grave

At a distance of ca. 25 m southeast of the T3 mantle, during the archaeological survey, an isolated grave was identified:

Grave 1/S – Inhumation burial in simple pit, rectangular with rounded corners in shape (1.70×1.20 m), the pit outline was identified at -1.60 m and the pit bottom reached -2.00 m. The deceased laid on the back, slightly tilted to the left side, oriented E-W and facing south (*Pl. 11.4–5*). The pit was filled with a dusty, yellow soil making the difference between this soil and sterile loess very difficult to notice. The preservation state of the bones is very good. No grave goods were found. Anthropological determination: male, 35.2–51.5 years.

Anthropological data

Material and methods

The analysed human skeletal remains came from two Bronze Age mounds discovered during the 2019 archaeological campaign from Aliman *Alira* (comm. Aliman, Constanța County). In the two mounds, recorded as T3 and T4 by the authors of the research, skeletal remains were identified from seven individuals, as follows (T3: one individual in Gr.1 and two individuals in Gr.2; T4: one individual in each of Gr.1, Gr.2, Gr.3 and Gr.4). In addition to this, during the same campaign, under the surveillance of archaeologists, another grave containing the skeletal remains of an individual (Gr.1/S) was identified at 25 m southeast of the T3 mantle. The eight individuals belong to the osteological collection of the Museum of National History and Archaeology Constanța.

Prior to the actual research of the osteological and dental fragments, the material was cleaned from sediment with water and partially restored for the examination of skeletal features. The anthropological analysis aimed mainly at establishing the minimum number of individuals, the degree of representativeness, the skeletal inventory, taphonomic changes and the state of preservation of the osteological material (FERNÁNDEZ-JALVO – ANDREWS 2016).

Determining the biological sex of individuals is a very important step for establishing the biological profile of a population. As such, sex influences the analysis of other skeletal features (skeletal stature, age-at-death). In the present study, it was determined only in adults, based on the discriminatory features of the pelvis (ventral arch, subpubic concavity, medial aspect of the ischiopubic ramus, large sciatic

notch and preauricular sulcus) and the skull (nuchal crest, mastoid process, supraorbital margin, glabella and mental eminence) (BUIKSTRA – UBELAKER 1994, 16–21). At the same time, for the highest possible accuracy in determining sex, a series of practices or recommendations for its diagnosis was adopted (ACSÁDI – NEMESKÉRI 1970, 75–87; FEREMBACH *et al.* 1980, 517–527).

Regarding the age-at-death, different estimation methods were used, depending on the age class of the individual: subadult or adult. Although the anthropological literature proposes numerous methods for determining the age-at-death for subadults, based on regression equations related to the maximum size of long bone diaphysis (FACCHINI – VESCHI 2004; BERNERT – EVINGER – HAJDU 2007; CARDOSO – ABRANTES – HUMPHREY 2014, to name a few), most of them were obtained on medieval (not prehistoric) skeletal lots. In addition, the individuals come from other geographical units than the Eurasian Steppe. Therefore, in our study, in order to estimate the age-at-death of subadults, we used not only cranial measurements (BUIKSTRA – UBELAKER 1994, 45; SCHAEFER *et al.* 2009, 29–31), the sequence of tooth formation and eruption (UBELAKER 1978, 46–47) and the degree of fusion of the epiphyses to the diaphysis (UBELAKER 1978, 53), but also dimensional comparisons with other skeletons of known age from the collection of the Anthropology Laboratory of the “Vasile Pârvan” Institute of Archaeology.

Much less accurate is the estimation of the age of adult individuals, in which values often fluctuate within very wide limits. In order to prevent, as much as possible, the obtaining of such values, in our research we took into account several methods of analysis. Subsequently, to estimate the age, we averaged the values obtained, based on all methods. Thus, regarding the skull, the degree of obliteration of the cranial sutures was recorded (MEINDL – LOVEJOY 1985, 63). Two other methods were related to features of the coxal bones: the examination of auricular surfaces (LOVEJOY *et al.* 1985) and of the changes in the pubic symphyses’ facets (BROOKS – SUCHEY 1990). Some degenerative morphological changes in the ribs are also good indicators of estimating age-at-death: the geometry of the articular facet and the surface texture of the costal tubercle of the first rib (DIGANGI *et al.* 2009). Other methods that we have taken into account are extremely valuable because, through them, it is certified that an adult is in the category of a young adult: the degree of fusion of the medial clavicular epiphyses (SHIRLEY – JANTZ 2010) and the one of the first two sacral vertebrae (S_1 – S_2) in anterior view (RÍOS – WEISENSEE – RISSECH 2008). In order to classify the individuals of this study according to their age-at-death, scholarly literature was consulted (BUIKSTRA – UBELAKER 1994, 9): fetal (F: < birth), infant (I: birth–3.0 years); child (C: 3.0–12.0 years); adolescent (AO: 12.0–20.0 years); young adult (YAd: 20.0–35.0 years), middle adult (MAd: 35.0–49.0 years) and old adult (OAd: > 50.0 years old).

The shape and size of the bones were highlighted by taking bilateral (L = left, R = right) measurements: cranial (MARTIN 1928, 625–678; BRÄUER 1988, 160–192) and postcranial (MARTIN 1928, 1005–1052; BRÄUER 1988, 193–232) and by calculating their indices (*Supplementary Table I*).

Influenced by many external and environmental factors, the most important of which are nutrition, climate and lifestyle, the skeletal stature was calculated for the Aliman population for both subadults (VISSER 1998, 415) and adults (RUFF *et al.* 2012, 606), based on regression equations, using the maximum lengths of long bones. Skeletal weight was also calculated, a very important standard related to the growth, development and health of individuals. The estimation of body mass was based on regression equations that include the diameter of the middle of the tibial diaphysis (VISSER 1998, 415–416), for children (3.0–12.0 years) and the vertical (transversal) diameter of the femoral head (AUERBACH – RUFF 2004, 334) for adult individuals (20+ years).

Indispensable from the anthropological analyses are the observations related to the dental and osteological pathological changes, which refer to the health status of individuals and, implicitly, to their ability to respond effectively to the action of multifactorial stress. For the few manifestations identified

in Aliman we used several treatises from the scholarly literature (ROGERS – WALDRON 1995; ORTNER 2003; HILLSON 2005).

Variability, genetic inheritance/kinship and biodistance can be traced through anatomical variants or non-metric traits. In order to achieve this, we considered the recording of discrete characters from the skull and from the postcranial skeleton (FINNEGAN 1978; HAUSER – DE STEFANO 1989; MANN – HUNT – LOZANOFF 2016), as well as from the teeth (TURNER II – NICHOL – SCOTT 1991; HADDOW 2012). We tracked their number and frequency, their placement, their shape and size, their degree of development or their bilaterality.

The investigation of the lifestyle of the analysed individuals was also carried out by recording the degree of development of enthesophytes, exclusively for adults. Musculoskeletal markers of biomechanical stress (functional, occupational) represent the result of daily, repeated, constant actions, performed with different intensities in the bone through ligaments, tendons and joint capsules. In our study, we examined several bone areas (entheses), bilaterally, from the: clavicle, scapula, humerus, radius, ulna, femur, patella, tibia and calcaneus (AL-OUAOU – JIMÉNEZ-BROBEIL – DU SOUICH 2004; MARIOTTI – FACCHINI – BELCASTRO 2007; MYSZKA – PIONTEK 2012; *Supplementary Table 2*).

Results

T3/Grave 1 – General characteristics. MNI: 1; preservation: very good; state of representation: approximately complete; sex: indeterminate; age-at-death: 7.0 years $\pm$ 24 months (dentition); age category: C (*infans* II); stature: 1108.4 $\pm$ 97.0 mm (L tibia); weight: 21.8–22.0 $\pm$ 0.2 kg (tibiae); taphonomy: traces of red ochre on the upper part of the skull.

Skeletal inventory. The neurocranium is approximately whole (missing the left temporal), but fragmentary. Zygomatic and sphenoid fragments have been preserved from the facial skeleton. Three permanent teeth were identified (LC[#]; RC[#]; LM¹). The spinal and costal skeleton are fragmented and incomplete. Only the elements from the right side have been preserved from the shoulder girdle. The pelvis lacks several fragments from the sacrum, pubis and coccyx. Some of the limb bones are complete (ulna, femur and L tibia), others incomplete (humeri, radii, R femur, R tibia, fibulae), while others have not been preserved (R ulna, patellae). Several phalanges of the hand, tarsals and metatarsals were also recovered.

Biomorphometric characteristics. The forehead has oval edges and is camemethopic. The L ulna is eulenic, the L femur is platymer with a null pilaster, while the tibiae are eurycnemic.

Non-metric traits. a) Cranial – supraorbital notch (R); supranasal suture; zygomaticofacial foramen (one wide, L; one wide and one narrow, R); parietal foramen (L); asymmetric apical bone; lambdoid ossicles (bilat.); hypoglossal canal (partially divided, R); tympanic dehiscence (R); mastoid foramen (one, on temporal, R); b) postcranial – Allen's fossa (L); superior articular atlas facet (simple, bilat.).

T3/Grave 2 (MNI = 2)

Grave 2, Individual 1 – General characteristics. Preservation: very good; state of representation: approximately complete; sex: male (coxals, skull); age-at-death: 18.5–39.4 years (pubic symphyses, auricular surfaces, cranial sutures, costal sternal heads, medial clavicular extremities); age category: YAd; stature: 166.4 [164.6–168.2] cm (middle); weight: 63.4–63.6 kg (femoral heads); taphonomy: some spots of red ochre on the skull (*Fig. 1.a*) and pelvis.

Skeletal inventory. The neurocranium is approximately complete, lacking several fragments from the basal segment. The zygomatics, the sphenoid and hyoid fragments, the maxilla and the mandible have been preserved from the skeleton of the face. Twenty-seven permanent teeth were identified (LI¹, LC[#]-LM³; RP¹-RM³; LI₁-LP₂, LM₂-LM₃; RI₁-RM₃); five teeth were postmortem lost (LI²; RI¹-RC[#];

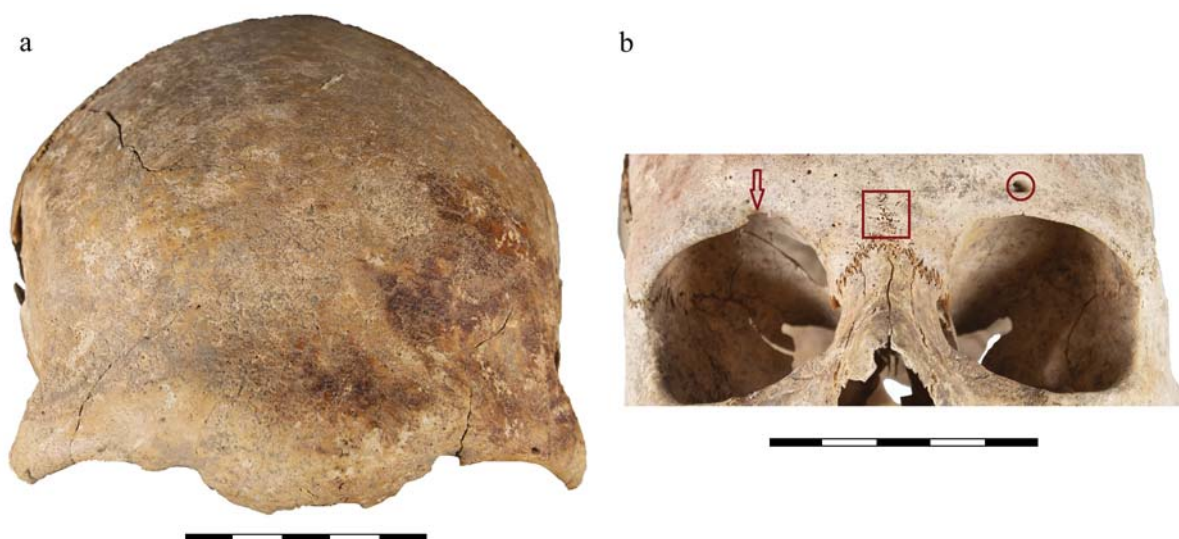


Fig. 1. a) Red ochre staining on the cranium (frontal, anterior – T3/Gr.2, II); b) Open supranasal suture (square), left supraorbital foramen (circle) and right supraorbital notch (T3/Gr.2, II)

LM₁). The spinal and costal skeleton are fragmented and incomplete. Considering the shoulder girdle of this individual, the clavicles are well preserved, while the scapulae are rather fragmentary. Regarding the pelvic bones, the coccyx is missing. The long bones of the limbs are relatively well represented and preserved. The patellae and the hand bones are missing.

Biomorphometric characteristics. The skull is long, narrow, mesocran, high, orthocran and metriocran. The forehead has a moderate minimum width, a narrow maximum width, oval edges, it is eurymethopic and camemethopic. The parietals are curved, and the occipital is of medium width. The face is moderately wide. The mandible is moderate intercondylarly, very wide intergonionally and dolicoostenomandibular. The L orbit is of medium length. The L clavicle is robust and short. The sacrum is platihiERIC. The humeri are euribrahic, the radii are of moderate length, and the ulnae are eurolenic. The R femur is eurymeric and has a weak pilaster, and the tibiae are mesocnemic.

Pathology. Dental diseases: dental calculus (LI¹, LC[#]-LM³ – lingual, labial and buccal; RP¹-RM³ – lingual and buccal; LI₁-LI₂ – labial, LI₁-LC_# – lingual; RI₁-RM₃ – lingual, RI₁-RC_# – labial).

Non-metric traits. a) Cranial – supraorbital notch (bilat.); supraorbital foramen (bilat.); supranasal suture (Fig. 1.b), zygomaticofacial foramen (multiple foramina, narrow, bilat.); parietal foramen (R); apical bone; lambdoid ossicles (bilat.); petrosquamous suture (bilat.); condylar canal (open, L); direction of flexure for superior sagittal sulcus (bifurcated); mental foramen (one, bilat.); mylohyoid bridge (partial, in the centre of the mylohyoid canal, R); styloid process (elongated, R); paramastoid process (bilat.); b) postcranial – Allen's fossa (R); hypotrochanteric fossa (bilat.); acromial articular facet (R); rhomboid fossa (bilat.); superior articular atlas facet (simple, bilat.); c) dental – hypoconulid (RM₁, moderate); rocker mandible (partially).

Grave 2, Individual 2 – General characteristics. Preservation: very good; state of representation: poorly represented; sex: indeterminate; age-at-death: 0.0–1.0 years (cranial measurements, dimensional comparison); age category: I.

Skeletal inventory. Only osteological remains from the neurocranium were preserved from the skeleton: fragments of the parietal squamae, the R temporal, the occipital squama and the sphenoid.

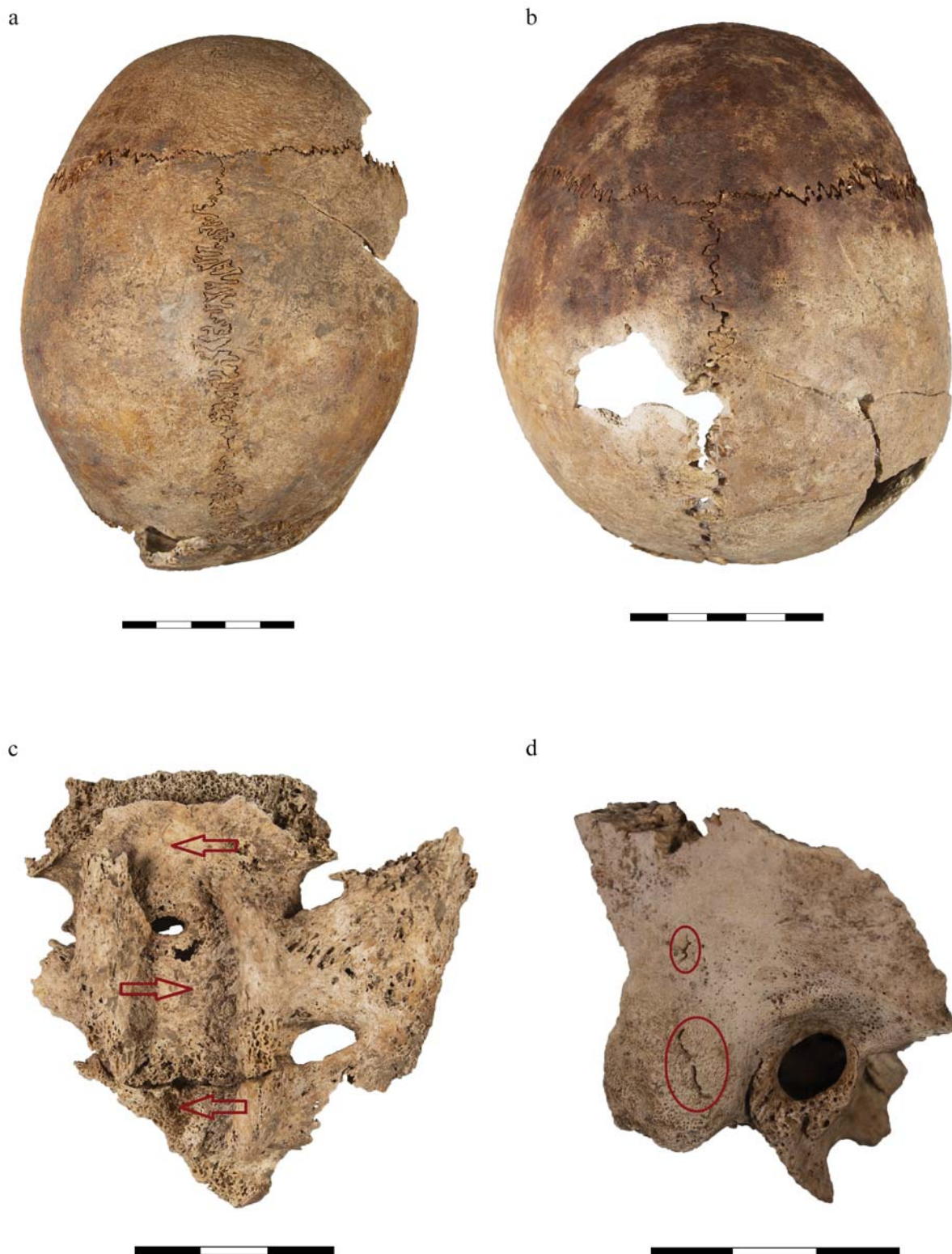


Fig. 2. a) Red ochre staining on the cranium (calotte, superior – T4/Gr.1); b) Red ochre staining on the cranium (calotte, superior – T4/Gr.2); c) Spina bifida occulta (sacrum S3-S5, posterior – T4/Gr.3); d) Remnants of the petrosquamous suture (right temporal bone – T4/Gr.4)

T4/Grave 1 – General characteristics. MNI: 1; preservation: mediocre; state of representation: approximately complete; sex: indeterminate; age-at-death: 12.0–14.0 years (epiphyseal fusion); age category: AO; taphonomy: traces of red ochre on the skull (*Fig. 2.a*) and arms.

Skeletal inventory. The neurocranium is partially complete (fragments of the frontal and R temporal are missing in particular). From the skeleton of the face have been preserved the L zygomatic, the R maxilla and the mandible (with the mental tubercles well highlighted). Twenty permanent teeth were identified (RI^2 - RM^3 ; LI_2 - LM_3 ; $RC_{\#}$ - RM_3); four teeth were postmortem lost (RI^1 ; LI_1 ; RI_1 - RI_2). Vertebrae from all segments have been preserved from the column, while the ribs are few and very fragmentary. The shoulder girdle is represented only by the L scapula. The sternum is missing. The pelvis is well preserved, except for the sacrum. The R radius, the bones of the hands and the R patella are missing.

Biomorphometric characteristics. The skull is dolichocran. The forehead is camemethopic, the parietals flattened, and the occipital wide. The mandible is dolicostenomandibular. The L ulna is eurolenic. The femurs are platymer, with a strong pilaster on the L. The tibiae are mesocnemic and the left patella is wide.

Pathology. 1) Dental diseases: dental calculus (RI^2 – labial; RP^1 - RM^2 – buccal; LM_1 - LM_2 , RM_1 - RM_2 – lingual); dental enamel hypoplasia ($C_{\#}$, bilat.); 2) Metabolic diseases: healed *cribra orbitalia* (L).

Non-metric traits. a) Cranial – supraorbital foramen (L); zygomaticofacial foramen (one wide, R); lambdoid ossicles (bilat.); condylar canal (open, bilat.); mastoid foramen (one, on temporal, L); mental foramen (one, bilat.); b) postcranial – hypotrochanteric fossa (bilat.); subcoronoid foramen (L); inferior talar articular surface (double, bilat.); superior articular atlas facet (simple, bilat.); c) dental – hypoconulid (LM_1 , LM_3 , moderate; RM_1 , small).

T4/Grave 2 – General characteristics. MNI: 1; preservation: good; state of representation: approximately complete; sex: indeterminate; age-at-death: 14.0–18.0 years (epiphyseal fusion); age category: AO; taphonomy: red ochre traces on skull (*Fig. 2.b*), right shoulder and feet.

Skeletal inventory. The neurocranium is approximately complete, but has some damage to the basal segment. The well-preserved facial skeleton lacks the inferior nasal conchae and the hyoid. The mandible has well-marked mental tubercles. Twenty-one permanent teeth were identified (LI^1 - LM^2 ; RI^1 - RM^2 ; LP_1 , LM_2 ; $RC_{\#}$ - RM_2); seven teeth were postmortem lost (LI_1 - LP_1 , LM_1 ; RI_1 - RI_2). The spine, sternum and costal skeleton are well preserved, with a few gaps at each segment. The R clavicle is missing from the shoulder girdle. Among the long bones of the limbs, better represented are the humeri, the L radius and the femurs. The patellae, metatarsals, and phalanges of the foot are missing.

Biomorphometric characteristics. The skull is brachicran, orthocran, and tapeinocran. The forehead has oval edges, is eurimetopic and orthometopic. The parietals are curved and the occipital is wide. The orbits are mesoconch, the nose is mesorhine, and the superior alveolar arch is mesuran. The palate is brahistaphylline and chemostaphylline, and the facial profile is orthognathic. The mandible is dolicostenomandibular. The humeri are euribrah, and the L ulna is eurolenic. The L femur is platymeric and the R, hyperplatimeric, with a weak pilaster.

Pathology. 1) Congenital and neuromechanical abnormalities: *spina bifida occulta* (at least in the S_3 - S_5 segments); spondylosis/ discitis (cervical and lumbar vertebrae); 2) dental diseases: dental calculus (I^1 - I^2 , bilat. – labial; M^1 - M^2 bilat. – buccal; $LC_{\#}$ – lingual; RM^2 – lingual; RM_1 - RM_2 – buccal; RP_2 , RM_2 – lingual); 3) infectious diseases: periostitis (on the tibial diaphysis, bilat.).

Non-metric traits. a) Cranial – supraorbital notch (R); supraorbital foramen (L); zygomaticofacial foramen (absent, L; one, wide, R); lambdoid ossicles (bilat.); petrosquamous suture (bilat.); condylar canal (open, bilat.); mastoid foramen (one, on temporal, bilat.); mental foramen (one, bilat.); mylohyoid bridge (partial, near the mandibular foramen, R); b) postcranial – hypotrochanteric fossa (bilat.); third trochanter (L); preauricular sulcus (bilat.); inferior talar articular surface (double, bilat.); anterior

calcaneal facet double (absent, bilat.); c) dental – interruption groove (in the middle of the cingulum, LI¹); dental tubercle (pronounced, LI²-LC[#]; strong, RC[#]); metacone (small, M², bilat.); congenital absence (M³, M₃, bilat.).

T4/Grave 3 – General characteristics. MNI: 1; preservation: poor; state of representation: partially represented; sex: male (coxals); age-at-death: 27.1–32.0 years (auricular surfaces; sacral fusion); age category: YAd; weight: 71.9 kg (R femoral head).

Skeletal inventory. The skull and the dentomaxillary apparatus are missing. Postcranially, several vertebrae from the thoracolumbar segment have been preserved. Regarding the ribs, only small fragments, without precise symmetry, have been conserved. The pelvic girdle is incomplete. Fragments of all long bones, several tarsals and metatarsals, were also identified.

Biomorphometric characteristics. The right femur is platymer and the right tibia is eurycnemic.

Pathology. 1) Congenital and neuromechanical abnormalities: *spina bifida occulta* (at least in the S₃-S₅ segments, *Fig. 2.c*); 2) intervertebral disk hernia (Schmorl's nodes on lumbar vertebrae); 3) infectious diseases: inflammatory porosities on basioccipital – tab. interna.

Non-metric traits. Postcranial – hypotrochanteric fossa (bilat.); inferior talar articular surface (double, bilat.).

T4/Grave 4 – General characteristics. MNI: 1; preservation: mediocre; state of representation: partially represented; sex: indeterminate; age-at-death: 3.0 years ± 12 months (dentition); age category: C (*infans* I); taphonomy: red ochre stains on upper skull.

Skeletal inventory. Fragments of parietal squamae, R temporal, and occipital squama have been preserved from the neurocranium. The viscerocranium is represented only by the L zygomatic, a fragment of the sphenoid, the maxilla and the mandible. Twelve deciduous and four permanent but unerupted teeth were identified (Li¹-LM¹; Rp¹-RM¹; Lp₁-LM₁; Rp₁-RM₁); nine deciduous teeth were lost postmortem (Ri¹-Rc[#]; i¹-c[#], i¹-c[#], bilat.). From the postcranial skeleton were preserved a body and a vertebral arch, some rib fragments, a fragment of the right scapula and fragments of the diaphysis of long bones (humeri, radii, L ulna, L femur, tibiae and R fibula) and two metatarsals.

Pathology. 1) Metabolic diseases: *porotic hyperostosis (cribra cranii)*, left parietal, exocranial); 2) infectious diseases (chronic sinusitis/ rhinitis).

Non-metric traits. a) Cranial – zygomaticofacial foramen (one wide and one narrow, L); petrosquamous suture (R) (*Fig. 2.d*); directions of flexure for superior sagittal sulcus (bifurcated); mental foramen (one, bilat.); b) dental – metacone (small, LM¹); Carabelli's cusp (small cusp, M¹, bilat.); anterior fovea (faint groove, M¹, bilat.).

Grave 1/S – General characteristics. MNI: 1; preservation: good; state of representation: approximately complete; sex: male (coxals, skull); age-at-death: 35.2–51.5 years (pubic symphyses, auricular surfaces, cranial sutures); age category: MAd; skeletal height: 177.2 [175.1–179.3] cm (high); skeletal weight: 73.3–74.2 kg (femoral heads).

Skeletal inventory. The neurocranium is well preserved and represented, except for some fragments in the area of the lambdoid sutures, the R temporal, and the basal segment. The zygomatics and fragments of the sphenoid, maxilla and mandible have been preserved from the facial skeleton. Eighteen permanent teeth were identified (LP¹-LM²; RI², RP²-RM²; LI₂-LM₁; RI₂-RC_#, RP₂-RM₂); M₃ was lost antemortem bilaterally, and ten teeth were lost postmortem (LI¹-LC[#], RI¹, RC[#], LI₁, LM₁-LM₂; RI₁, RP₁). The spine and sternum are missing, while the costal skeleton is incomplete and fragmentary. Regarding the girdles, the right clavicle, the sacrum and the coccyx are also missing. Skeletal remains from the upper limbs, except for the R humerus and the carpals, have been preserved. The patellae and phalanges are missing from the lower limbs.

Biomorphometric characteristics. The skull is very narrow. The forehead is wide according to the minimum width, narrow following the maximum width, has oval edges, is eurimetopic and orthometopic. The orbits have moderate lengths. The mandible is wide (intercondylar and intergonional) and dolicoctenomandibular. The L humerus is euribrah, the L radius is of medium length, and the L ulna is eurolenic. The L femur is eurymeric with a medium pilaster, while the R one is platymer with a null pilaster. The tibiae are platycnemic.

Pathology. 1) dental diseases: dental calculus (I²-C[#] bilat. – labial); antemortem tooth loss (M₃ bilat.); dental caries (LP¹ – occlusal; RM¹-RM² – distal; RM₂ – buccal); radicular fragments (RI²; LP₂); 2) joint diseases: osteoarthritis (porous surface with irregular contour – at the level of the L medial clavicular head; osteophytes – hand phalanges, palmar).

Non-metric traits. a) Cranial – supraorbital notch (L); supraorbital foramen (multiple foramina, R); zygomaticofacial foramen (one wide and one narrow, L; absent, R); mental foramen (one, bilat.); mandibular torus (moderate, bilat.); b) postcranial – exostoses on the trochanteric fossa (R); lateral tibial squatting facets (bilat.); acetabular crease (bilat.); acromial articular facet (L); inferior talar articular surface (double, bilat.); anterior calcaneal facet double (bilat.); peroneal tubercle (R); c) dental – rocker mandible (partially).

Table 1. Synoptic table with the main anthropological characteristics highlighted in the individuals from the Bronze Age burials of Aliman Alira

Grave	Sex	Age-at-death (yrs.)	Stature	Body mass (kg)	Osteological and dental pathologies
T3/Gr.1	–	7.0 (C)	1108.4 mm	21.8–22.0	–
T3/Gr.2, I1	M	18.5–39.4 (YAd)	166.4 cm (middle)	63.4–63.6	Dental calculus
T3/Gr.2, I2	–	0.0–1.0 (I)	–	–	–
T4/Gr.1	–	12.0–14.0 (AO)	–	–	Dental calculus; enamel hypoplasia; <i>cribra orbitalia</i>
T4/Gr.2	–	14.0–18.0 (AO)	–	–	Spina bifida <i>occulta</i> ; spondylosis/ discitis; dental calculus; periostitis
T4/Gr.3	M	27.1–32.0 (YAd)	–	71.9	Spina bifida <i>occulta</i> ; intervertebral disk hernia; inflammatory porosities
T4/Gr.4	–	3.0 (C)	–	–	<i>Hyperostosa porotica (cribra cranii)</i> ; sinusitis/ rhinitis
Gr.1/S	M	35.2–51.5 (MAd)	177.2 cm (high)	73.3–74.2	Dental calculus; antemortem tooth loss; dental caries; radicular fragments; osteoarthritis

Burial practices, relative, and absolute chronology

The mounds from Aliman are part of a larger display of such monuments from Dobroudja and north-eastern Bulgaria (SCHUSTER *et al.* 2011, 58–59; AILINCĂI *et al.* 2014; 2016, with previous bibliography; ALEXANDROV – SLAVCHEV – TONKOVA 2021). Series of mounds were documented at Baia, Ceamurlia de Jos, Jurilovca, Sălcioara, Zebil, Lăstuni, Mihail Kogălniceanu, Luncavița, Mihai Bravu in Dobroudja (SCHUSTER *et al.* 2011, 58–59) or the spectacular area from the southern part of the Prut-Dniestr interfluvium (TOPAL – VORNIC – POPOVICI 2019, 17–19, Fig. 7–10), let alone the northeastern part of Bulgaria, especially in Vetrino area (ALEXANDROV – SLAVCHEV – TONKOVA 2021, 24, Pl. II). Dobroudja

is a very important part of the Yamnaya story since it represents one of three main routes of the migration towards west (DANI 2020, 51–52, Fig. 8). New infrastructure projects such as highways, wind turbines or expansion of localities create the opportunity for new excavations in the region, which, complemented by interdisciplinary approaches focusing on chronology, biological ancestry, diet, activity patterns of the individuals, provide a better understanding of the lifestyle of these communities¹.

In order to obtain detailed information about the chronological sequence in which the two mounds investigated in Aliman were raised and used, seven samples of human bone, one from each grave, were selected and sent to be radiocarbon dated. The analyses were performed at Bristol Radiocarbon Accelerator Mass Spectrometry Facility (BRAMS) within the framework of the ERC Advanced project 788616: The Yamnaya Impact on Prehistoric Europe (YMPACT). The results generated are presented in *Table 2*.

Table 2. Radiocarbon dates of the graves from Aliman

Context	Sample	Lab code	BP date	BC calibrated date (95.4% probability) ²
T3/Gr.1	Human bone	BRAMS-3569	4516±29	3357–3263 (30.9%) 3247–3101 (64.5%)
T3/Gr.2	Human bone	BRAMS-3570	4279±30	3008–2987 (2.4%) 2931–2872 (91.2%) 2799–2782 (1.9%)
T4/Gr.1	Human bone	BRAMS-3571	4157±29	2878–2661 (89.5%) 2655–2631 (6.0%)
T4/Gr.2	Human bone	BRAMS-3572	4418±28	3318–3239 (11.7%) 3173–3164 (0.8%) 3105–2921 (82.9%)
T4/Gr.3	Human bone	BRAMS-3573	3316±27	1669–1656 (1.7%) 1635–1608 (93.8%)
T4/Gr.4	Human bone	BRAMS-3574	4390±28	3083–2916 (95.4%)
Gr.1/S	Human bone	BRAMS-3575	4096±28	2859–2806 (20.6%) 2753–2721 (7.9%) 2703–2571 (64.3%) 2517–2500 (2.6%)

The calibration and modelling of the ¹⁴C dates (*Figs. 3–4*) revealed five burial sequences. Given the proximity of the two mounds, the results were analysed together. However, it should be noted that further research of the other burial mounds of the necropolis could alter the chronological frame presented below. In this article, we do not aim to offer a definitive picture of the absolute chronology of these funerary monuments in the region, but rather intend to explore the processes by which these two mounds were built and how they correlate with the wider tumular phenomenon. Thus, firstly, mound T3 was built for Gr.1; it was followed by mound T4 built for Gr.2, with the circular ditch around it, and then Gr.4 shortly after; the third sequence is represented by Gr.2 from the Mound T3, the fourth one by Gr.1 from Mound T4 and Gr.1/S from survey, and, finally, the fifth one by Gr.3 from Mound T4. The

¹ Samples from the mounds excavated in Aliman are currently part of aDNA research carried out at Johannes Gutenberg-Universität Mainz as well as isotope research carried out at the University of Bristol within the framework of the Yamnaya Impact on Prehistoric Europe project.

² The C14 dates were calibrated with OxCal v4.4.4 BRONK RAMSEY (2009); r:5 Atmospheric data from REIMER *et al.* (2020).

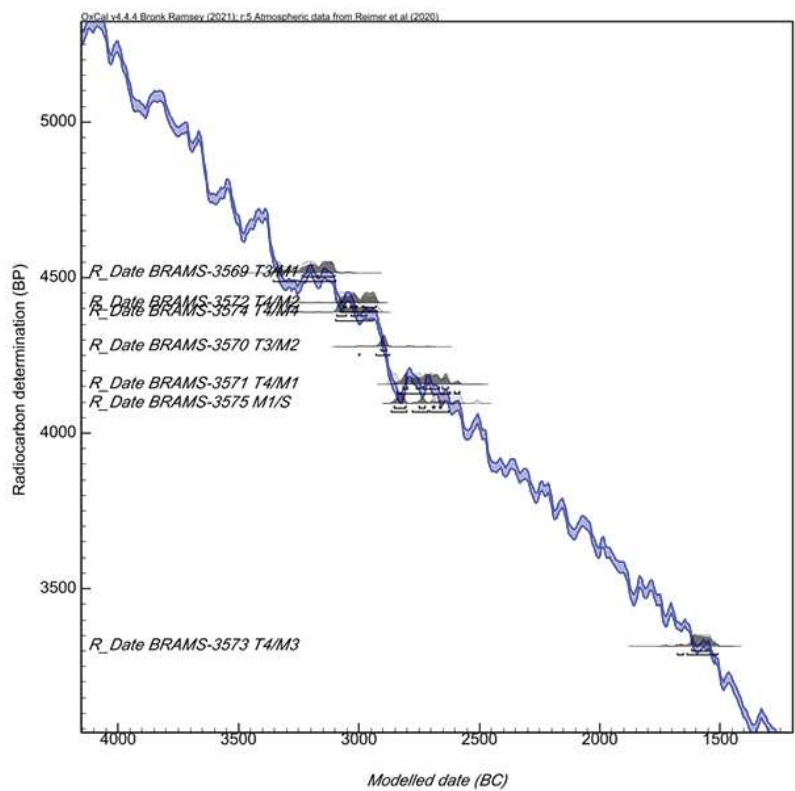


Fig. 3. Modelled dates from Aliman

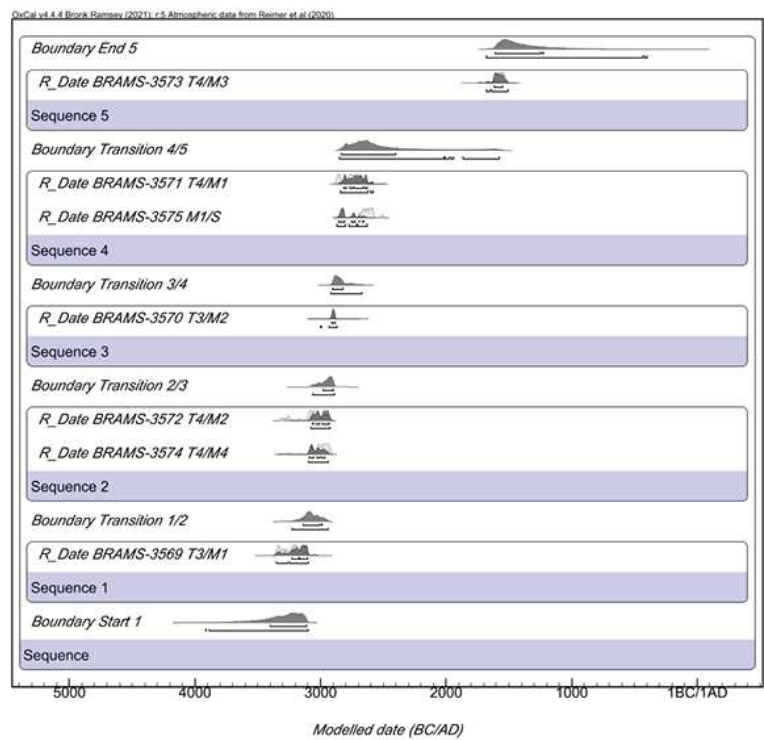


Fig. 4. The burial sequences from Aliman

stratigraphic information, along with the characteristics of the burial ritual listed in *Table 3*, and the ^{14}C dates obtained for the graves in Aliman enable a more complex discussion regarding the absolute and relative chronology of burial mounds in Dobroudja as well as the transformation of burial practices in time.

Table 3. Data on stratigraphic position, sex, age, position and orientation of bodies

Grave	No. ind.	Main grave	Secondary grave	Sex	Age	Position	Orientation
T3/Gr.1	1	x	–	Indet.	7.0	Extended	NE–SW
T3/Gr.2 (Ind. 1)	2	–	x	M	18.5–39.4	Supine	E–W
T3/Gr.2 (Ind. 2)	3	–	x	Indet.	0.0–1.0	–	–
T4/Gr.1	4	–	x	Indet.	12.0–14.0	Supine, slightly tilted on the right side	N–S
T4/Gr.2	5	x	–	Indet.	14.0–18.0	Supine	NE–SW
T4/Gr.3	6	–	x	M	27.1–32.0	Crouched on the left side	NE–SW
T4/Gr.4	7	–	x	Indet.	3.0	Supine	E–W
Gr.1/S	8	–	–	M	35.2–51.5	Supine, slightly tilted on the left side	E–W

The first phase of mound construction dates from the last third of the 4th millennium BC when the primary burial (Gr.1) of Mound 3 (T3) was performed (3357–3101 cal BC³). Gr.1 contained an individual laid in extended position in an oval pit, while in secondary Gr.2, individual 1 was laid in a typical Yamnaya posture, supine with raised knees and arms along the body, and had been sprinkled with ochre. The characteristics of the funerary ritual in the primary grave as well as the stratigraphic relationship with the secondary grave (Gr.2) are of particular importance.

Analogies for the practice of laying the dead in extended position were found in grave 3 from Mound 1 in Vitănești, southern Romania (FRÎNCULEASA – MIREA – TROHANI 2017), grave 3 from mound II in Sărăteni (Moldova) (LEVIŢKI – MANZURA – DEMCENKO 1996, 36), and grave 6 from Tiszavasvári-Deákhalom in Hungary (DANI 2011, 28; HORVÁTH *et al.* 2013, 160). Grave 2 from *Ciganska humka* in Šajkaš, Serbia, should also be mentioned here. Despite the absence of human osteological remains, the long shape and size of the wooden funerary structure suggest it could have been built for an individual laid in extended position, being very similar to that uncovered in grave 6 from Tiszavasvári-Deákhalom (KOLEDIN *et al.* 2020, 355)⁴. Other graves hold valuable information on the stratigraphy and relative chronology of these burials, even though they lack absolute dates. In Goran Slatina/Mound III (Bulgaria) the following stratigraphic sequence was registered: the main grave (No. 9) with an individual lying crouched on the side, surrounded by a stone cromlech, was followed by two extended inhumations in oval pits (graves 6 and 7), and later on by graves of the Yamnaya culture (KITOV – PANAYOTOV – PAVLOV 1991, 62–74; ALEXANDROV 2011, 315). The same stratigraphic situation was recorded for grave 3 in Kalugeritsa/Mound III (Bulgaria) (ALEXANDROV 2011, 311). In Corlăteni (Romania), extended grave 2

³ Dates mentioned in the article are calibrated at 2 σ , 95.4% probability.

⁴ A similar feature was identified in the Püspökladány-Kincsesdomb kurgan, grave 2, but the chronological attribution of this grave is not clear (DANI – HORVÁTH 2012, 34, 78–79, Fig. 16–17).

was stratigraphically later than a Zhivotilovka-Volchansk grave (Gr.1)⁵ with an individual crouched on the side, but earlier than graves with Yamnaya burial ritual (COMȘA 1982; MANZURA 2016, 57)⁶.

The number of ¹⁴C dates of extended inhumations is rather limited. Results for the graves in Șajkaș, and Vitănești indicate the very end of the 4th millennium BC and the beginning of the 3rd millennium BC. However, two ¹⁴C dates were obtained for Grave 6 in Tiszavasvári-Deákhalom, with different results, one calibrated to 3090–2894 cal BC, but the other one covering the last third of the 4th millennium BC (3326–2926 cal BC), closer to the date from Sărăteni (3370–3090 cal BC) and the new date obtained for Aliman Gr.1/Mound 3 (3357–3101 cal BC) (Table 4).

Table 4. Radiocarbon dates of extended inhumations

Site/Grave	Material dated	Lab ID	BP date	BC calibrated date (95.4% probability)	Literature
Aliman T3/Gr.1	human bone	BRAMS-3569	4516±29	3357–3101	–
Sărăteni T.2/Gr.3	–	LU-2477	4530±40	3370–3090	RASSAMAKIN 2013
Șajkaș, <i>Ciganska humka</i> /Gr.2	wood	Poz-88659	4320±60	3014–2889	KOLEDIN <i>et al.</i> 2020
Șajkaș, <i>Ciganska humka</i> /Gr.2	wood	Poz-88659	4385±35	3075–2923	KOLEDIN <i>et al.</i> 2020
Tiszavasvári-Deákhalom/Gr. 6	human bone	Poz-39209	4350±40	3090–2894	HORVÁTH <i>et al.</i> 2013
Tiszavasvári-Deákhalom/Gr.6	human bone	Poz-40857	4430±30	3326–2926	HORVÁTH <i>et al.</i> 2013
Vitănești, Mound I/Gr. 3	human bone	DeA-12800	4256±30	2919–2761	FRÎNCULEASA – MIREA – TROHANI 2017

The next three phases are connected with the arrival and persistence of the Yamnaya burial ritual in the region for half a millennium. The main grave (Gr.2 - 3318–3239 (11.7%) 3173–3164 (0.8%) 3105–2921 (82.9%) cal BC) and a secondary grave added immediately after (Gr.4 - 3083–2916 cal BC) to mound 4 date from the end of the 4th and the beginning of the 3rd millennium BC. These features document the occurrence of the Yamnaya burial ritual with its typical characteristics: the supine position with raised knees of the individuals, ochre staining, orientation in the eastern or western sector. A circular enclosing ditch dug around the main grave (Gr.2) was identified, a practice attested in other mounds as well, in Dobroudja at Medgidia-Mound T3 (SCHUSTER *et al.* 2011, 61–62, Fig. 18), but also east of the Prut at Balaban, Baștanovka, Glubokoe, Nerušaj, Ogorodnoe (MOTZOI-CHICIDEANU 2011, 266, Pl. 97), Brânceni Noi (AGULNIKOV – MISTREANU 2014, 50, Fig. 8), Cimișlia (POPOVICI *et al.* 2016, 20–21, Fig. 2, 3), Crihana Veche (CIOBANU – AGULNICOV 2016, 46–47, Fig. 2–4). In Muntenia, in a mound excavated in Târgșoru Vechi, the ditch was dug around the main grave of a sub-adult individual (FRÎNCULEASA 2019, 132). One has to mention that although not prevailing, double burials, in some cases containing adults and children, are not so uncommon and were documented south and north of the Lower Danube and east of the Tisza, such as Gr.3 from Mound 1 in Cimișlia; Gr.19 in Smeeni, Gr.5 in Chudomir, or Gr.7 in Sárretudvary-Órhalom (GERLING *et al.* 2012; FRÎNCULEASA 2019; ALEXANDROV 2021).

⁵ Attribution made by F. BURTĂNESCU (2002, 109), and I. MANZURA (2016, 57).

⁶ Several other extended inhumations that could be included in a more complex discussion do not provide reliable stratigraphic information or absolute dates so their contribution to clarifying the situation is limited. Such examples are Polsko Kosovo grave 1, Anadolchioi T1/Gr.1 to mention only two (for an extensive list see ALEXANDROV 2010 and FRÎNCULEASA – MIREA – TROHANI 2017).

The following period is marked by the secondary grave (Gr.2 - 3008–2987 (2.4%); 2931–2872 (91.2%); 2799–2782 (1.9%) cal BC) from mound 3, dated at the beginning of the 3rd millennium BC, and shows the continuation of the Yamnaya burial traditions. The latest Yamnaya phase in the Aliman mounds is roughly dated between 2850–2550 cal BC and is represented by two graves: Gr.1 from mound 4 (2878–2661 (89.5%) 2655–2631 (6.0%) cal BC), but also one flat grave (Gr.1/S) found in the proximity of the mounds (2859–2806 (20.6%) 2753–2721 (7.9%) 2703–2571 (64.3%) 2517–2500 (2.6%) cal BC). Both graves display a similar burial ritual, different from the previous phase, the individuals being laid on the back but tilted slightly to one side, either right or left, with one arm flexed and another one stretched along the body, towards the knees.

The final phase of mound use is documented by grave 3 from mound 4, for which a date of 1669–1608 cal BC was obtained, placing it in the Middle Bronze Age. The human osteological remains were severely disturbed by modern interventions and only the lower limbs of the individual were preserved *in situ*. From their position we can only infer that the individual was laid in crouched position on the left side.

The Aliman mounds in the wider landscape

The intensive research carried out in the past years in the wider steppe-like landscapes of Southeastern Europe has significantly altered our understanding of the chronology and characteristics of the tumular phenomenon. In Dobroudja (Tulcea and Constanța Counties), research conducted in the past 15 years in several mounds has significantly increased the archaeological and anthropological information available: Cernavodă – T7, T7a, T7b (SIMALCSIK – SIMALCSIK 2013), Medgidia – T3 (SCHUSTER *et al.* 2011), Medgidia – T5, T6 (Vasile, unpublished anthropological report), Rahman – T1 (AILINCĂI *et al.* 2014; CONSTANTINESCU – SOFICARU 2013) and Rahman – T2 (AILINCĂI *et al.* 2016). The different chronological phases identified in the two mounds researched in Aliman echo results obtained for the other mounds excavated in Dobroudja, as well as regions north and south of the Lower Danube, south of the Balkans, east of the Tisza river, while opening up new interpretation possibilities.

The chronology of the funerary ritual of extended inhumations from the Eneolithic to the Bronze Age was thoroughly discussed in the past years, therefore below we will only briefly touch upon the time frame covered by the Aliman dates (ALEXANDROV 2010; 2011; RASSAMAKIN 2013; FRÎNCULEASA – MIREA – TROHANI 2017; WŁODARCZAK 2020).

The ¹⁴C dates previously obtained for the extended inhumation in Vitănești, the grave in Šajkaš, and one date from Tiszavasvári-Deákhalom indicated the very end of the 4th millennium BC and the beginning of the 3rd millennium BC, which would make these features contemporary with early Yamnaya graves. Based on these results, it has been hypothesised that this group of extended inhumations corresponds to the horizon of expansion of Yamnaya communities to the west starting with 3100–3000 BC, or even that this ritual could have been one of the variants of the arrangement of burials used by the early Yamnaya communities (WŁODARCZAK 2020, 142, 145). However, as already pointed out, a second date from Tiszavasvári-Deákhalom, the date from Sărăteni and the one from Aliman attest the existence of this ritual earlier, in the last third of the 4th millennium BC. The relationship with late 4th millennium BC graves assigned to what is called the pre-Yamnaya phase and to the Zhivotilovka-Volchansk phenomenon, usually with individuals crouched on the side, needs to be further explored, but at least in terms of absolute chronology they are contemporary (FRÎNCULEASA – MIREA – TROHANI 2017, 87; Fig. 1; DANI 2020; FRÎNCULEASA 2021a, 175 ff.). In northern Moldova a horizon of extended inhumations that are stratigraphically later than Zhivotilovka-Volchansk was documented (MANZURA 2016, 57; WŁODARCZAK 2020).

Overall, from the available absolute dates, we can clearly distinguish a group of extended inhumations in mounds, in oval or rectangular pits arranged with wooden beams, covering the last third of the 4th millennium BC and the beginning of the 3rd millennium BC, contemporary with the pre-Yamnaya and early Yamnaya phase. Stratigraphically, these graves seem to be placed in between Zhivotilovka-Volchansk/pre-Yamnaya burials and early Yamnaya ones, but further research and more secure contexts are required. The chronological/stratigraphic and also cultural relationship between these different funerary traditions with steppe origins (crouched, extended and supine postures of the individuals) intersecting at the western end of the Great Steppe Belt between 3300–2900 BC is still open for exploration. There are also indications that the funerary ritual of extended inhumations was preserved during the later Yamnaya phases as well, if only isolatedly. This is supported by grave 1 from Zeglartsi mound 2, a secondary grave with an extended individual and a ¹⁴C date around 2800–2600 cal BC (ALEXANDROV 2021, Fig. 18/2; Pl. 2)⁷. However, this idea was rejected by some scholars and would indeed need more evidence to support it (RASSAMAKIN 2013).

The next three phases fall within the chronology and ritual practices established in the past years for the Yamnaya phenomenon in its western distribution area. The earliest occurrence of the typical Yamnaya burial ritual is dated to the last century of the 4th millennium BC and the first century of the next one, as shown by graves 2⁸ and 4 from Aliman/Mound 4. Similar intervals were obtained for tumular burials in other regions of Romania (FRÎNCULEASA 2021a), Bulgaria (KAISER – WINGER 2015; ALEXANDROV 2021, Pl. 2)⁹, and Hungary (HORVÁTH *et al.* 2013). The burial ritual becomes highly standardised, the individuals are now laid in rectangular pits with rounded corners, in supine position with their knees initially raised and arms along the body, with the head oriented westwards or eastwards, often sprinkled with red ochre, or ochre lumps were placed on the pit bottom; the pits were covered with wooden beams and mats made of vegetal textiles (PREDĂ-BĂLĂNICĂ – FRÎNCULEASA – HEYD 2020, 87).

The next interval, represented by the secondary double grave (Gr.2) from mound 3 and dated in the first centuries of the 3rd millennium BC, shows the continuation of the previous phase and, through the presence of a jug with a raised handle as a grave good, the incorporation of local pottery into the burial ritual of communities raising mounds. This practice was noticed throughout the western Yamnaya area and suggests interactions between steppe and local elements (ALEXANDROV 2021; FRÎNCULEASA 2021a). The latest Yamnaya phase in the Aliman mounds is dated between 2850–2550 BC and represented by two graves: Gr.1 from mound 4, and one flat grave (Gr.1/S) found in the proximity of the mounds. This phase highlights a change in burial practices, from the supine posture to individuals laid slightly tilted to one side, with flexed legs, one arm stretched out to the knees and the other one bent. This change, supported by both stratigraphic information and absolute dates, has been confirmed in other mounds in Dobroudja (AILINCĂI *et al.* 2016), Muntenia (FRÎNCULEASA *et al.* 2017), but also between the Prut and the Dniester where this posture is considered specific to the Budzhak (later) phase of the Yamnaya culture (DERGACHEV 2021).

The last grave (Gr.3) was added to mound 4 in the 2nd millennium BC. Recent research highlights the possibility that secondary graves in burial mounds, most often attributed to the Yamnaya phase, might actually belong to the Middle Bronze Age and mark the persistence of north-west-Pontic elements (FRÎNCULEASA 2020).

⁷ Grave no. 2 in mound III from Goran Slatina also seems to be stratigraphically contemporary to Yamnaya graves in the same mound, but no absolute dates are available (KITOV – PANAYOTOV – PAVLOV 1991, 66, fig. 40; ALEXANDROV 2010, 280). Other graves that could be dated to the 3rd millennium BC are graves 4 and 13 from Goran Slatina (KITOV – PANAYOTOV – PAVLOV 1991, 58–59, fig. 33–34).

⁸ Although this date gave an overall larger interval, the most significant part of it falls between 3105–2921 cal BC (82.9% probability).

⁹ The absolute chronology of the earliest Yamnaya graves is still a debated topic (ALEXANDROV 2021, 309; ANTHONY 2021; FRÎNCULEASA 2021b, note 50).

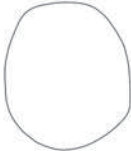
pre-Yamnaya	≈3300-3100 BC			ochre no grave goods
Yamnaya	≈3100-2850 BC			ochre 
	≈2850-2500 BC			ochre no grave goods
Middle Bronze Age	≈1700-1600 BC			no ochre no grave goods

Fig. 5. Overview of the chronological phases and burial practices in Aliman mounds

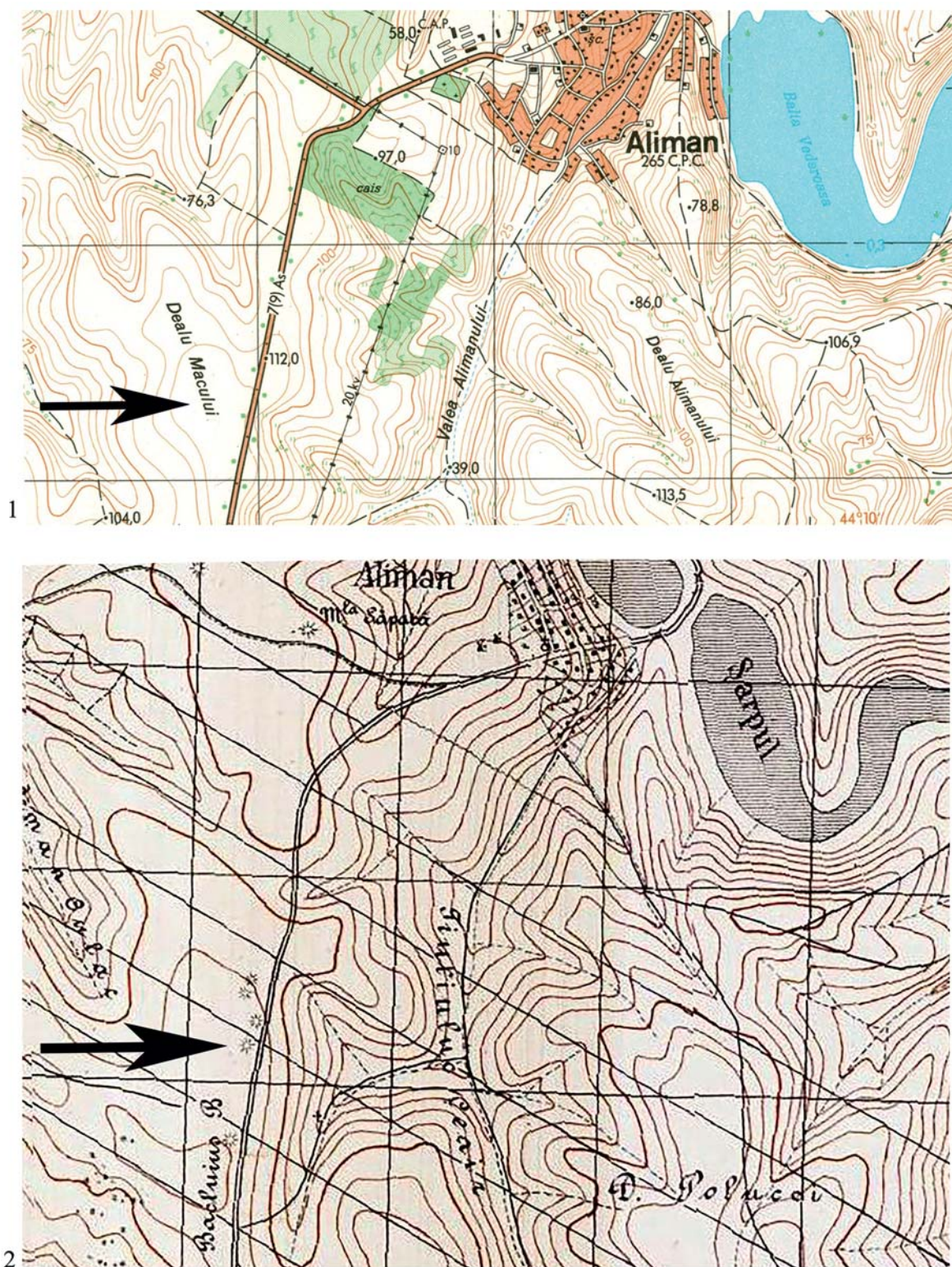
The burial practices documented in Aliman, analysed through the perspective of stratigraphy and absolute chronology (Fig. 5), offer a glimpse into the long lasting world of funerary mounds in Dobroudja and the wider steppe landscapes of Southeastern Europe, more precisely into a period of one and a half millennia, from the last third of the 4th millennium BC to the first half of the 2nd millennium BC. However, in terms of chronology and elements of the burial ritual these discoveries find analogies not only in burial mounds but also discoveries of isolated flat graves or necropolises contemporary to burial mounds. Although the latter are not particularly rare, the relationship between flat and tumular burials is currently underexplored due to their poor publication and general lack of absolute dates. More information comes from a necropolis recently investigated in Jijila (AILINĂI *et al.* 2021). Several graves covering a period from the end of the 4th millennium BC to the 2nd millennium BC were researched, showing similarities of the burial ritual such as the shapes of grave pits, the posture of the dead, and the use of ochre, but in the absence of a burial mound. New research is starting to fill in the gaps and offer a more complex understanding of the life of communities in the region during the Bronze Age.

Acknowledgements

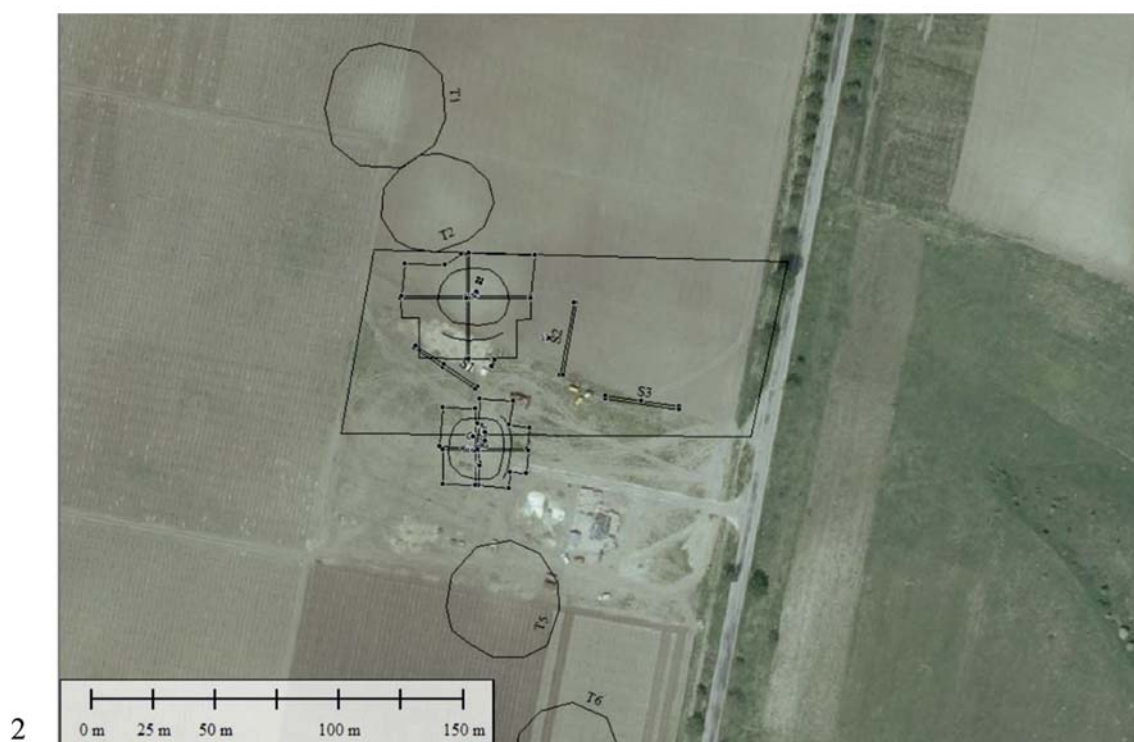
B. P.-B. and M. T. wrote their contributions to this paper within the framework of the ERC Advanced project 788616: The Yamnaya Impact on Prehistoric Europe (YMPACT). The authors are very grateful to Mr. Cristian Virag for the precious help with radiocarbon dates modelling. We would also like to thank our colleague Cătălin Nicolae (“Vasile Pârvan” Institute of Archaeology, Bucharest) for the photos



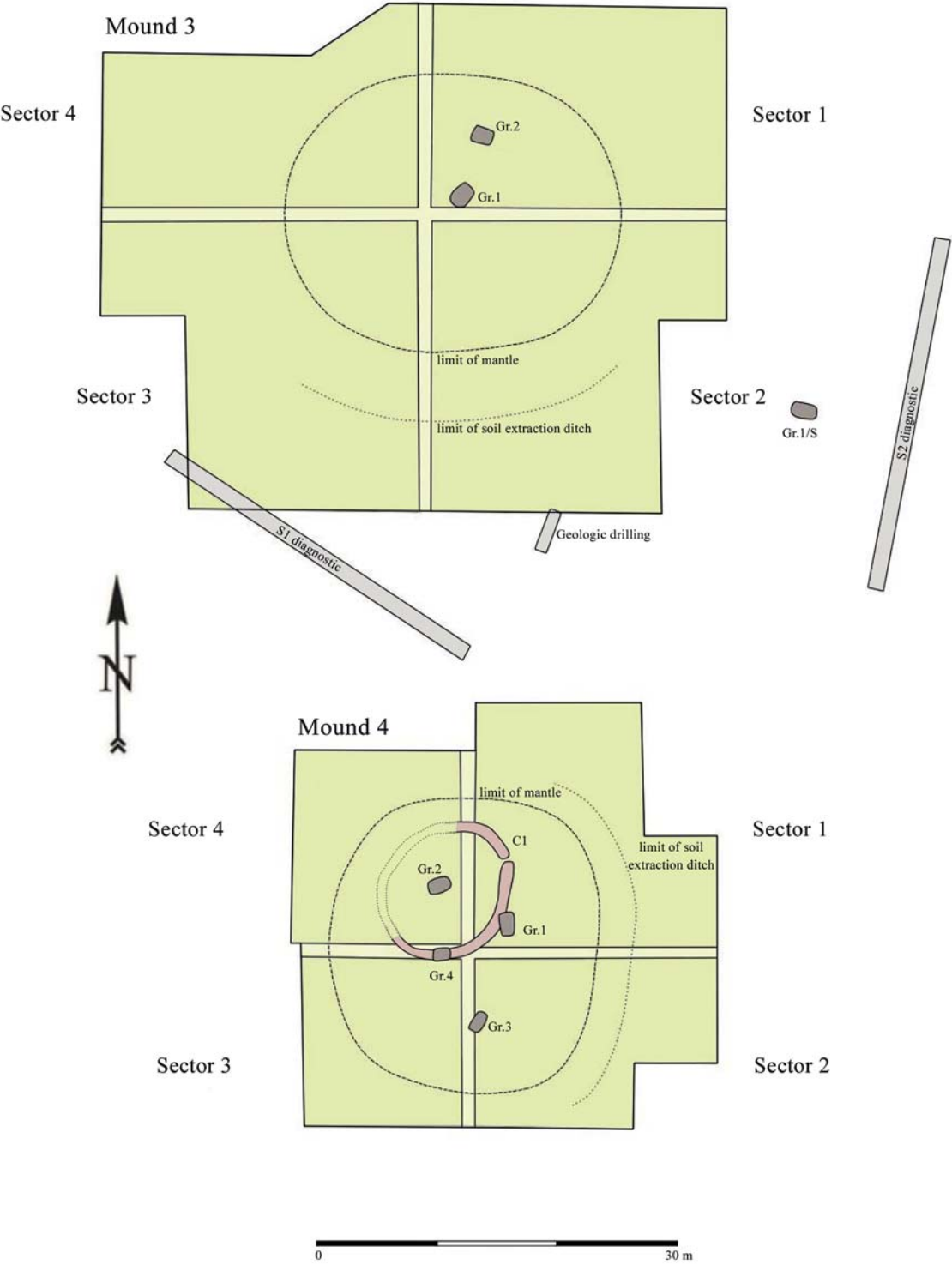
Pl. 1. Map of the Yamnaya mounds from Dobroudja: excavated (white squares) and with anthropological analyses (red triangles) (map Bogdan Olariu)



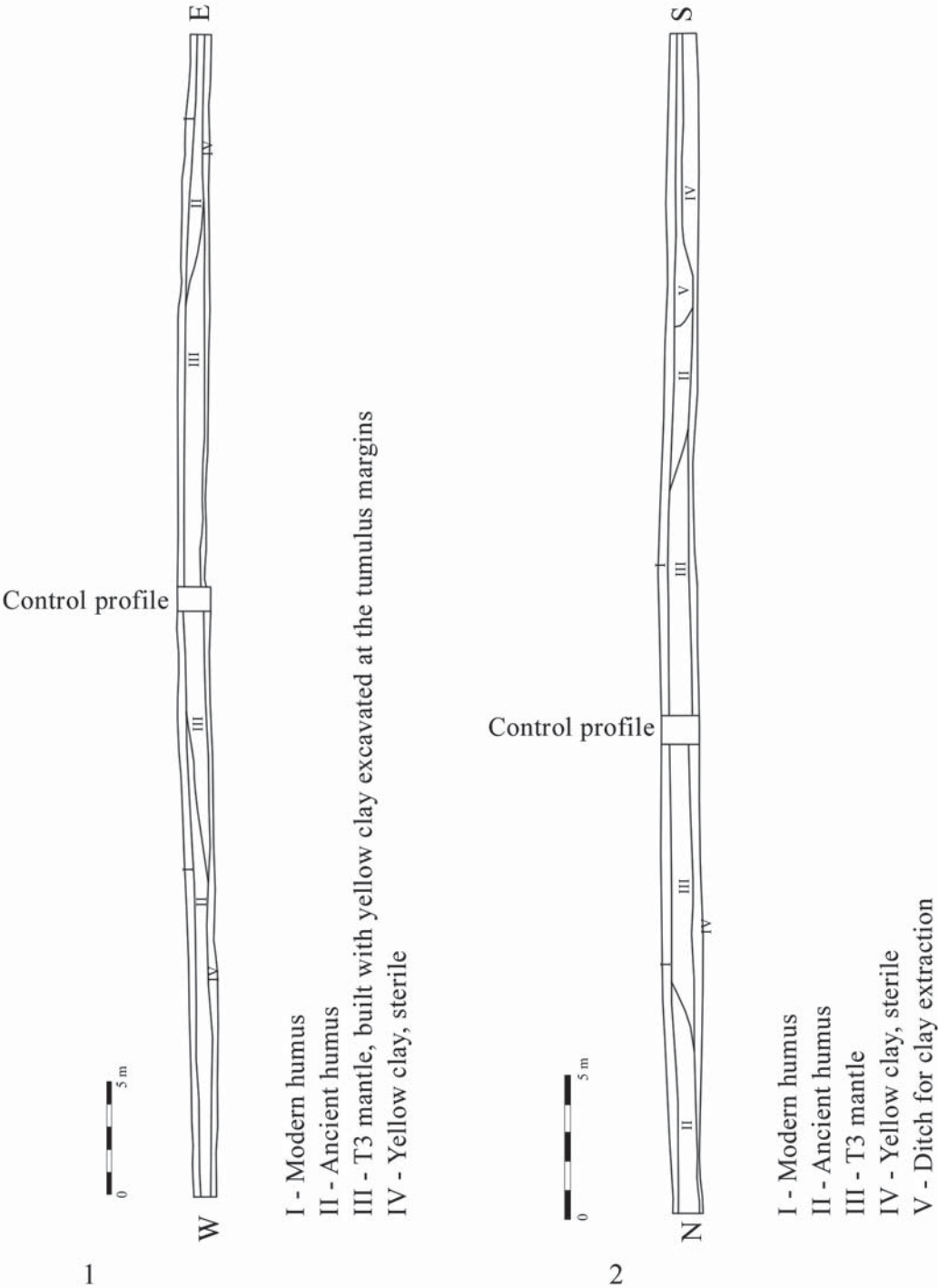
Pl. 2. 1. The topographic position of Aliman-Dealul Macului on a map of Department of Military Topography (Sc. 1:25.000) 2. Five of the Aliman mounds on Artillery Firing Plans (Sc. 1:20.000)



Pl. 3. 1. The eight mounds row from Aliman-Dealul Macului on an ortophotomap; 2. Detail with Mounds 3 and 4



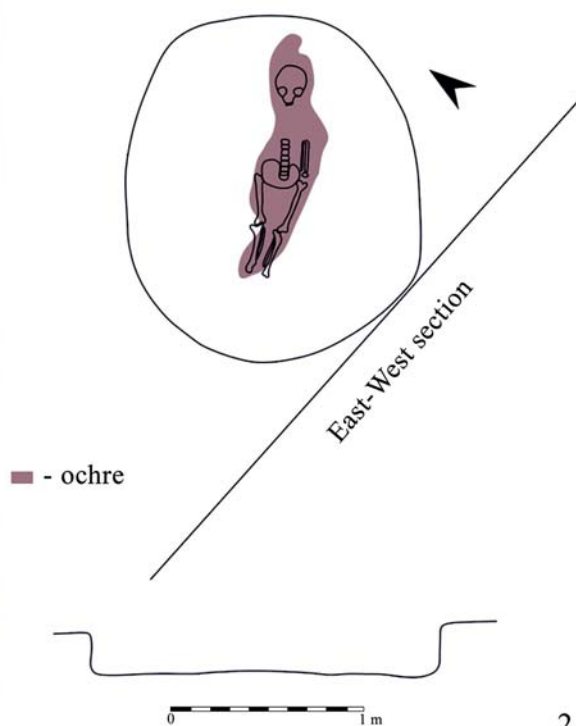
Pl. 4. The general excavation plan of Mounds 3 and 4



Pl. 5. Stratigraphic outliers of Mound 3 (N-S and E-W)



1

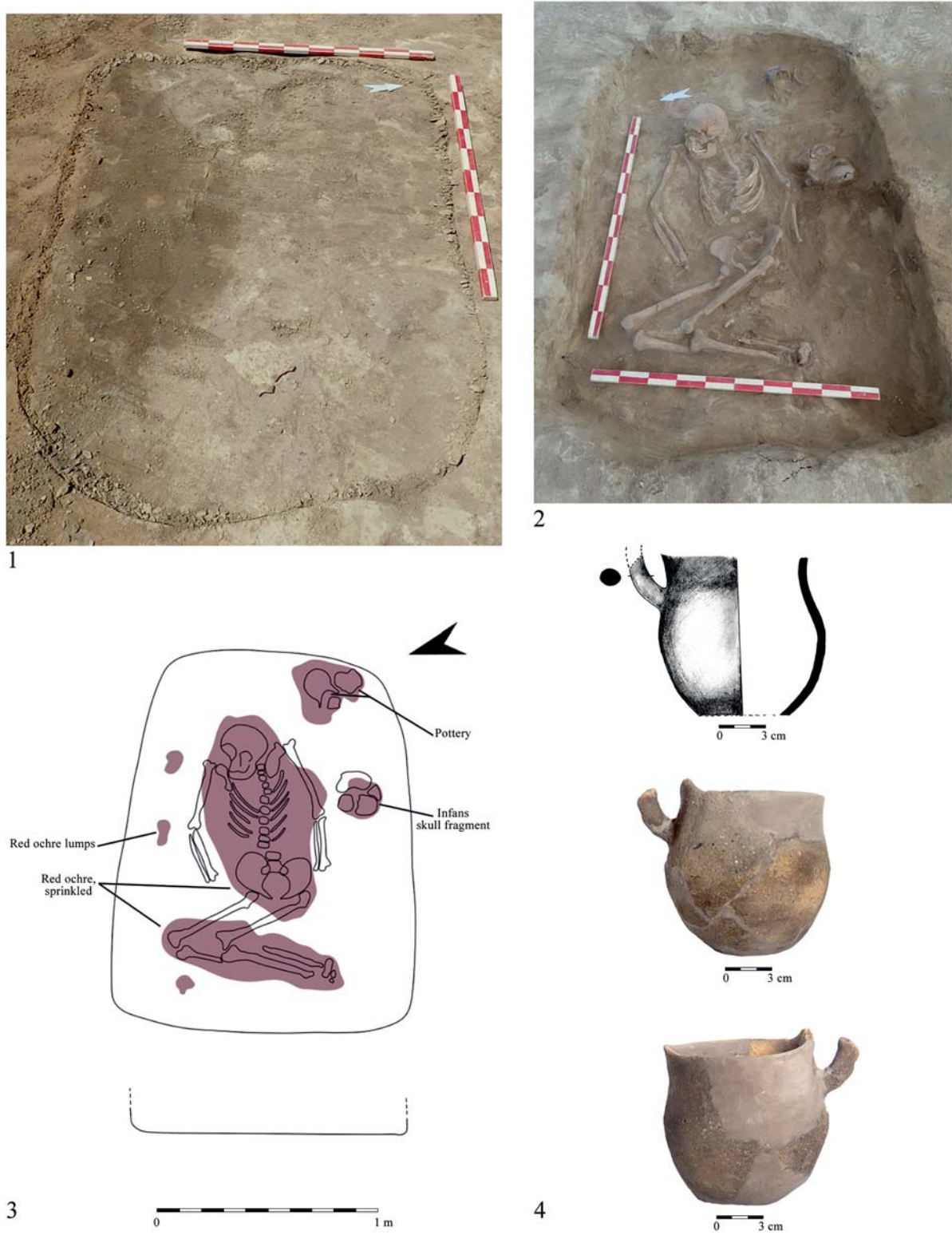


2

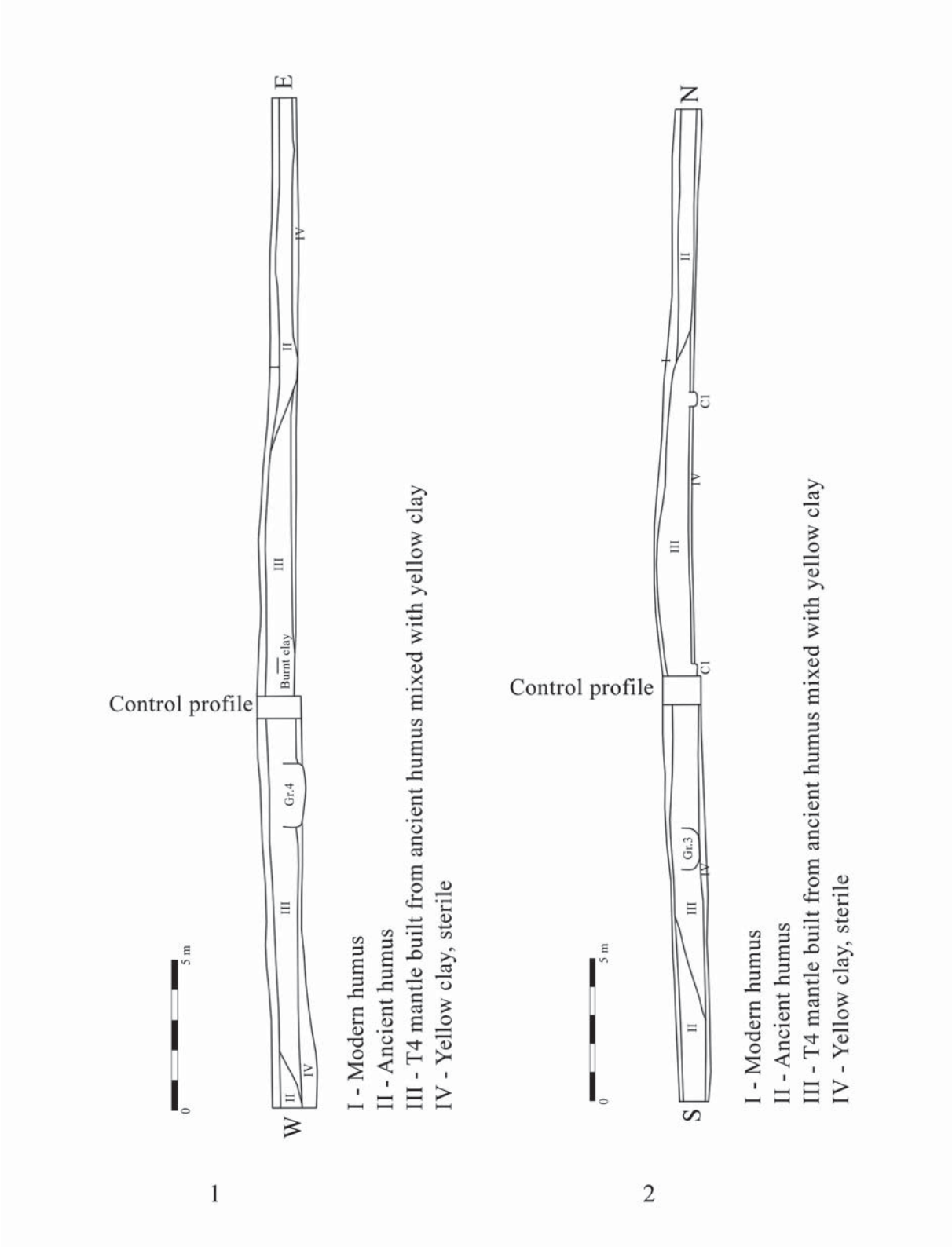


3

Pl. 6. Grave 1 from Mound 3: the outline of the grave pit (1), drawing and photo of grave 1 (2–3)



Pl. 7. Grave 2 from Mound 3: the outline of the grave pit (1), photos and drawing of grave 2 (2–3), drawing and photo of the pot found in the grave (4)



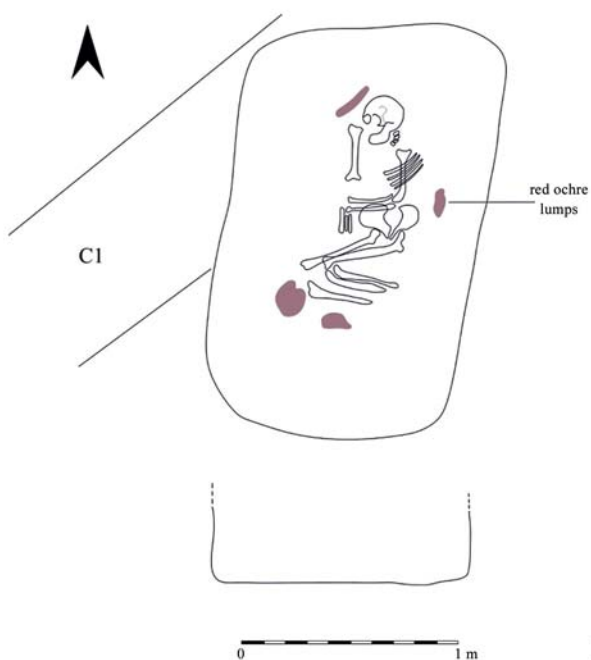
Pl. 8. Stratigraphic outliers of Mound 4 (N-S and E-W)



1



2

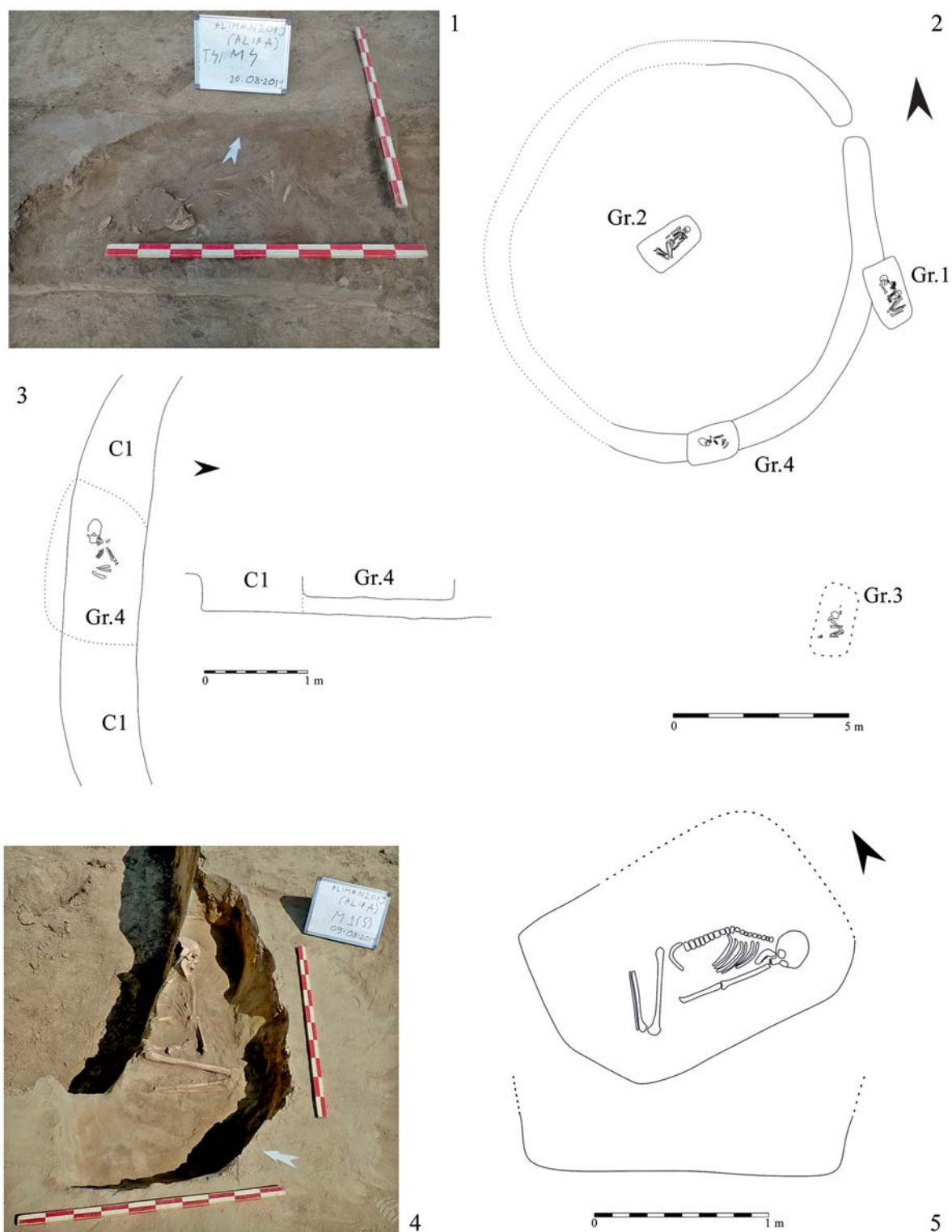


3

Pl. 9. Grave 1 from Mound 4: the outline of the grave pit and C1 ditch (1), photo and drawing of grave 1 (2–3)



Pl. 10. Grave 2 from Mound 4: photos and drawing (1–2); Grave 3 from Mound 4: the outline of the grave pit (3), photos and drawing of grave 3 (4–5)



Pl. 11. Grave 4 from Mound 4: photo and drawing (1, 3); detail of Mound 4 with the enclosing ditch (2); the grave from survey (Gr.1/S), photo and drawing (4-5)

of the skeletal material, Ingrid Petcu-Levei (National History and Archaeology Museum, Constanța) for drawing the vessel, and Bogdan Olariu for creating the map illustrated in Plate 1. The authors would like to express their deepest appreciation to Dr. Constantin Băjenaru, the scientific coordinator of the excavation, for kindly allowing us to publish archaeological material from Aliman.

Supplementary information

Supplementary Table 1. Bilateral dimensions (L/R, in mm) and indices, cranial and postcranial, in individuals from Aliman Alira

Martin nr.	T3/Gr.1	T3/Gr.2, II	T4/Gr.1	T4/Gr.2	T4/Gr.3	T4/Gr.4	Gr.1/S
1		191.2	181.1	169.0			
8		143.9	130.1	138.8			137.1
11		75.3	71.8	82.1			
17				126.1			
20		120.3					
12				74.6			
13				90.8			
14		62.9					
15		83.6					
9	92.1	100.4		99.4			106.4
10	106.2	116.4	116.2	114.5			118.4
112	86.7	86.3		86.9			89.9
113		69.8		71.6			77.6
26	110.0	136.0	117.0	122.0			131.0
29	100.3	123.6	105.4	103.8			113.6
122	91.1	90.9	90.1	85.0			86.7
27		136.0	124.0	128.0			
30		119.3	112.2	110.1			
124		87.7	90.5	86.0			
12		111.8	103.9	113.3			
114		77.7	79.9	81.6			
45		131.5					
46						80.2	
51	31.6/32.6	41.47/-	34.84/-	35.8/35.7			39.5/39.7
52				29.7/29.5			
142				83.0/82.5			
54				24.1		20.3	
55				51.1			
148				47.1			
60				52.7			
61				59.8		51.5	
154				113.5			

Martin nr.	T3/Gr.1	T3/Gr.2, II	T4/Gr.1	T4/Gr.2	T4/Gr.3	T4/Gr.4	Gr.1/S
62				36.8			
63				35.0		30.0	
64		13.82/-	-/10.9	9.4/9.6			-/13.2
I58				95.0			
I59				26.8/27.4			
5				116.2			
40				113.5			
I60				97.7			
65		119.0	100.1	112.3			124.1
66		119.0	85.3	98.3			107.1
68		107.4	95.8	98.1			111.9
I62		90.3	95.6	87.4			90.2
80(2)		44.0/44.0					50.9/50.9
C1		141.7/-					167.7/-
C6		40.0/-					38.0/-
C6:C1		28.2/-					22.7/-
H1		325.1/329.2		315.7/312.5			349.1/-
H2		316.5/322.1		311.4/309.4			344.2/-
H5		24.8/25.2		20.3/21.5			22.02/-
H6		19.3/19.7		17.8/16.6			17.5/-
H6:H5		77.8/78.3		87.6/77.0			79.2/-
R1		248.9/248.9	208.3/-				266.1/-
U1	149.9/-		242.4/-				
U13	12.7/-	23.9/23.7	19.9/-	19.9/-			20.5/-
U14	14.6/-	24.1/23.9	22.8/-	20.1/-			23.8/-
U13:U14	86.6/-	99.0/99.4	87.4/-	99.0/-			85.9/-
S2		106.6					
S5		110.7			130.0		
S5:S2		103.9					
F1	242.5/-	-/447.6	389.3/-	-/385.4			501.8/500.0
F2		-/445.6					500.1/493.8
F6	15.1/-	-/30.9	27.8/-	-/26.7			30.8/27.0
F7	15.3/-	-/28.3	21.6/-	-/25.0			26.8/28.8
F9	22.7/-	-/33.3	30.2/30.4	33.0/34.6	-/35.4		33.6/37.1
F10	18.3/-	-/28.8	25.3/25.7	25.2/24.8	-/28.5		32.3/29.0
F19		45.7/45.8			-/49.2		50.1/49.7
F21		-/79.8	66.0/-				84.6/86.5
F6:F7	98.7/-	-/109.1	128.7/-	-/106.6			114.9/93.9
F10:F9	80.6/-	-/86.4	83.7/84.5	76.4/71.7	-/80.4		96.2/78.2
P2			41.0/-				
T1a	203.5/-						
T1b	204.9/-						

Martin nr.	T3/Gr.1	T3/Gr.2, I1	T4/Gr.1	T4/Gr.2	T4/Gr.3	T4/Gr.4	Gr.1/S
T8	18.1/18.2						
T8a	19.6/19.8	38.1/38.3	32.3/33.1		-/38.9		39.7/39.3
T9a	15.2/14.4	25.8/25.8	21.8/21.6		-/28.8		23.2/23.5
T9a:T8a	77.6/72.5	67.6/67.4	67.6/65.3		-/74.1		58.5/59.9
C1:H2		44.8/-					48.7/-
R1:H2		78.6/77.3					77.3/-
R2:F21			62.2/-				

Supplementary Table 2. The bilateral entheses considered in the present study and the degree of development of enthesophytes (x = unobservable; 1 = weak expression; 2 = moderate expression; 3 = well defined entesophytes)

Enthesis		T3/Gr.2, I1	T4/Gr.3	Gr.1/S
Clavicle	<i>L. costoclaviculare</i>	3/3	x/x	1/x
	<i>L. conoideum</i>	1/x	x/x	2/x
	<i>L. trapezoideum</i>	1/x	x/x	1/x
	<i>M. pectoralis major</i>	2/2	x/x	2/x
	<i>M. deltoideus</i>	1/x	x/x	1/x
Scapula	<i>M. teres minor</i>	1/1	x/x	3/x
	<i>M. triceps brachii</i>	1/1	x/x	3/x
Humerus	<i>M. pectoralis major</i>	2/2	x/x	2/x
	<i>M. latissimus dorsi, m. teres major</i>	3/3	x/x	3/x
	<i>M. deltoideus</i>	3/3	x/x	2/x
	<i>M. brachioradialis</i>	2/2	x/x	2/x
Radius	<i>M. biceps brachii</i>	1/1	x/x	3/x
	<i>M. pronator teres</i>	1/1	x/x	2/x
	<i>Membrana interossea antebrachii</i>	1/1	x/x	1/x
Ulna	<i>M. triceps brachii</i>	1/1	x/x	2/x
	<i>M. brachialis</i>	2/2	x/x	2/x
	<i>M. supinator</i>	1/1	x/x	2/x
Femur	<i>Trochanter major</i>	1/1	x/1	x/2
	<i>M. iliopsoas</i>	1/1	x/2	2/2
	<i>M. gluteus maximus</i>	1/1	x/2	2/2
	<i>M. vastus medialis</i>	1/1	x/1	2/2
	<i>Linea aspera</i>	1/1	x/2	2/2
Patella	<i>T. quadriceps</i>	x/x	x/x	x/x
Tibia	<i>L. patellae</i>	1/1	x/x	2/2
	<i>M. soleus</i>	1/2	x/x	3/3
Talus	<i>Calcaneal tendon</i>	1/x	x/2	3/3
	<i>T. abductor hallucis, t. flexor digitorum brevis</i>	x/x	x/x	x/x

References

- ACSÁDI, G. – NEMESKÉRI, J. 1970
History of human life span and mortality. Budapest 1970.
- AGULNIKOV, S. – MISTREANU, E. 2014
 Cercetările de salvare de la tumulul de lângă s. Brânzenii Noi (r-nul Telenești). *Arheologia preventivă în Republica Moldova* I/1–2 (2014) 43–54.
- AILINCĂI, S. – MIHAIL, F. – CAROZZA, L. – CONSTANTINESCU, M. – SOFICARU, A. – MICU, C. 2014
 Une découverte funéraire de début de l'Âge de Bronze en Dobroudja (Sud-est de la Roumanie). Le tumulus de Rahman (com. Casimcea, dép. de Tulcea). *Prilozi Instituta za arheologiju u Zagrebu* 31 (2014) 73–87.
- AILINCĂI, S. C. – FLORIAN, S. – CONSTANTINESCU, S. – CAROZZA, L. – MICU, C. – BURENS, A. 2016
 Decouverte d'un tumulus de l'âge du bronze à Rahman sur la commune de Casimcea (dép. Tulcea). *Studii și Cercetări de Istorie Veche și Arheologie* 67/1–2 (2016) 29–52.
- AILINCĂI, S. C. – CONSTANTINESCU, M. – DIMA, A. – SAVA, G. – MIHAIL, F. – MICU, C. et al. 2021
 Bronze Age graves at Jijila (Southeastern Romania). In: Heyd, V. – Kulcsár, G. – Preda-Bălănică, B. (eds.): *Yamnaya Interactions. Proceedings of the International Workshop held in Helsinki, 25–26 April 2019*. The Yamnaya Impact on Prehistoric Europe, vol. 2. Budapest 2021, 207–242.
- ALEXANDROV, S. 2010
 Prehistoric barrow graves with extended inhumations between Danube and Balkan range. *Studia Praehistorica* 13 (2010) 277–292.
- ALEXANDROV, S. 2011
 Prehistoric Barrow Graves between the Danube and the Balkan Range. Stratigraphy and relative chronology. In: Borgna, E. – Müller-Celka, S. (eds.): *Ancestral Landscapes: Burial mounds in the Copper and Bronze Ages (Central and Eastern Europe – Balkans – Adriatic – Aegean, 4th–2nd millennium BC)*. Travaux de la Maison de l'Orient et de la Méditerranée 58. Lyon 2011, 307–320.
- ALEXANDROV, S. 2021
 Fourth/third millennium BC barrow graves in North-East Bulgaria (120 years of investigations). In: Heyd, V. – Kulcsár, G. – Preda-Bălănică, B. (eds.): *Yamnaya Interactions. Proceedings of the International Workshop held in Helsinki, 25–26 April 2019*. The Yamnaya Impact on Prehistoric Europe, vol. 2. Budapest 2021, 271–314.
- ALEXANDROV, S. – SLAVCHEV, V. – TONKOVA, E. 2021
 Rescue excavations of Bronze Age barrows in Vetrino region, northeast Bulgaria. *Materiale și Cercetări Arheologice S.N. XVII* (2021) 5–48.
- ANTHONY, D. 2021
 Early Yamnaya chronology and origins from an archaeological perspective. In: Heyd, V. – Kulcsár, G. – Preda-Bălănică, B. (eds.): *Yamnaya Interactions. Proceedings of the International Workshop held in Helsinki, 25–26 April 2019*. The Yamnaya Impact on Prehistoric Europe, vol. 2. Budapest 2021, 15–45.

AUERBACH, B. M. – RUFF, C. B. 2004

Human body mass estimation: a comparison of “morphometric” and “mechanical” methods. *American Journal of Physical Anthropology* 125/4 (2004) 331–342.

BERNERT, ZS. – EVINGER, S. – HAJDU, T. 2007

New data on the biological age estimation of children using bone measurements based on historical populations from the Carpathian Basin. *Annales Musei Historico-Naturalis Hungarici* 99 (2007) 199–206.

BRÄUER, G. 1988

Osteometrie. In: Knußmann, R. – Schwidetzky, I. – Jürgens, H.W. – Ziegelmayer G. (eds.): *Anthropologie. Handbuch der vergleichenden Biologie des Menschen*. Zugleich 4. Auflage der Lehrbuchs der Anthropologie, begründet von Rudolf Martin, Sonderdruck, Bd. I/1: Wesen und Methoden der Anthropologie, Gustav Fischer Verlag, Stuttgart 1988, 160–232.

BRONK RAMSEY, C. 2009

Bayesian analysis of radiocarbon dates. *Radiocarbon* 51(1) (2009) 337–360.

BROOKS, S. – SUCHEY, J. M. 1990

Skeletal age determination based on the os pubis: a comparison of the Acsádi-Nemeskéri and Suchey-Brooks methods. *Human Evolution* 5/3 (1990) 227–238.

BUICKSTRA, J. E. – UBELAKER, D. H. 1994

Standards for data collection from human skeletal remains. Arkansas Archaeological Survey Research, Series No. 44, Fayetteville 1994.

BURTĂNESCU, F. 2002

Epoca timpurie a bronzului între Carpați și Prut cu unele contribuții la problemele perioadei premergătoare epocii bronzului în Moldova. București 2002.

CARDOSO, H. F. V. – ABRANTES, J. – HUMPHREY, L. T. 2014

Age estimation of immature human skeletal remains from the diaphyseal length of the long bones in the postnatal period. *International Journal of Legal Medicine* 128/5 (2014) 809–824.

CIOBANU, I. – AGULNICOV, S. 2016

Investigațiile arheologice de la Crihana Veche. Rezultatele campaniei 2015. *Arheologia preventivă în Republica Moldova* III (2016) 45–60.

COLESNIUC, S. – POTĂRNICHE, T. – MOTOTOLEA, A. – CLIANTE, T. – STANC, S. M. 2020

Intramuros Archaeological Research at Sacidava. Preliminary Information. In: Forțiu, S. (Ed.): *ArheoVest VIII/1 – In Honorem Alexandru Rădulescu – Interdisciplinaritate în Arheologie și Istorie*. Timișoara 2020, 375–384.

COMȘA, E. 1982

Morminte cu ocră descoperite la Corlăteni. *Thraco-Dacica* 3 (1982) 85–93.

CONSTANTINESCU, M. – SOFICARU, A. 2013

Analiza antropologică a osemintelor din tumulul de la Rahman (jud. Tulcea). In: Ailincăi, S. C. – Țârlea, A. – Micu, C. (eds.): *Din preistoria Dunării de Jos. 50 de ani de la începutul cercetărilor arheologice la Babadag, Proceedings of “Lower Danube Prehistory. 50 years of excavations at Babadag” Conference, Tulcea, September 20th–22th*. Tulcea 2013, 487–494.

DANI, J. 2011

Research of Pit-Grave Culture Kurgans in Hungary in the last three decades. In: Pető, Á. – Barcsi, A. (eds.): *Kurgan Studies: An Environmental and Archaeological Multiproxy Study of Burial Mounds*

in the Eurasian Steppe Zone. British Archaeological Reports International Series 2238. Oxford 2011, 25–69.

DANI, J. 2020

Kurgans and their builders: The Great Hungarian Plain at the dawn of the Bronze Age. *Hungarian Archaeology* 9/2 (2020) 1–20.

DANI, J. – HORVÁTH, T. 2012

Őskori kurgánok a magyar Alföldön. A Gödörsíros (Jamnaja) entitás magyarországi kutatása az elmúlt 30 év során. Áttekintés és revízió. Budapest 2012.

DERGACHEV, V. 2021

Budzhakskaya «kul'tura» skvoz' prizmu kartograficheskogo metoda. *Materialy po Arkheologii i Istorii Antichnogo i Srednevekovogo Prichernomorja* 13 (2021) 99–144.

DIGANGI, E. A. – BETHARD, J. D. – KIMMERLE, E. H. – KONIGSBERG, L. W. 2009

A new method for estimating age-at-death from the first rib. *American Journal of Physical Anthropology* 138/2 (2009) 164–176.

FACCHINI, F. – VESCHI, S. 2004

Age determination on long bones in a skeletal subadults sample (b-12 years). *Collegium Antropologicum* 28/1 (2004) 89–98.

FEREMBACH, D. – SCHWIDETSKY, I. – STLOUKAL, M. 1980

Recommendations for age and sex diagnoses of skeletons. *Journal of Human Evolution* 9/7 (1980) 517–549.

FERNÁNDEZ-JALVO, Y. – ANDREWS, P. 2016

Atlas of Taphonomic Identifications. 1001+ Images of Fossil and Recent Mammal Bone Modification. Dordrecht 2016.

FINNEGAN, M. 1978

Non-metric variation of the infracranial skeleton. *Journal of Anatomy* 125/1 (1978) 23–37.

FRÎNCULEASA, A. 2019

The children of the steppe: descendance as a key to Yamnaya success. *Studii de Preistorie* 16 (2019) 129–168.

FRÎNCULEASA, A. 2020

Contributions regarding the Middle Bronze Age period in northern Muntenia. In: Matei, S. (ed.): *Bronze and Iron Ages in Eurasia: Rituals and Grave Goods as Possible Markers of the Social Identity of the Dead, Buzău County Museum, 17th–20th of October 2019.* Mousaios. Buletinul Științific al Muzeului Județean Buzău XXIII. Buzău 2020, 127–144.

FRÎNCULEASA, A. 2021a

Burial mounds in the Lower Danube region. From the international to the local and the other way round. In: Heyd, V. – Kulcsár, G. – Preda-Bălănică, B. (eds.): *Yamnaya Interactions. Proceedings of the International Workshop held in Helsinki, 25–26 April 2019.* The Yamnaya Impact on Prehistoric Europe, vol. 2. Budapest 2021, 173–205.

FRÎNCULEASA, A. 2021b

The Yamnaya mounds and the local cultural traditions of the first half of the 3rd millennium in Muntenia. The archaeological excavations of Moara Vlăsiei (Ilfov County). *Ziridava. Studia Archaeologica* 35 (2021) 49–105.

FRÎNCULEASA, A. – MIREA, P. – TROHANI, G. 2017

Local cultural settings and transregional phenomena: on the impact of a funerary ritual on the Lower Danube in the 4th millennium BC. *Buletinul Muzeului Județean Teleorman. Seria Arheologie* 9 (2017) 75–116.

FRÎNCULEASA, A. – SIMALCSIK, A. – PREDA, B. – GARVĂN, D. 2017

Smeeni-Movila Mare: monografia unui sit arheologic regăsit. Târgoviște 2017.

GERLING, C. – BÁNFFY, E. – DANI, J. – KÖHLER, K. – KULCSÁR, G. – SZEVEŘÉNYI, V. – HEYD, V. 2012

Immigration and transhumance in the Early Bronze Age Carpathian Basin: the occupants of a kurgan. *Antiquity* 86/334 (2012) 1097–1111. <https://doi.org/10.1017/S0003598X00048274>

HADDOW, D. S. 2012

Dental morphological analysis of roman era burials from the Dakhleh Oasis, Egypt. PhD thesis, Institute of Archaeology, University College, London.

HAUSER, G. – DE STEFANO, G. F. 1989

Epigenetic variants of the human skull. Stuttgart 1989.

HILLSON, S. 2005

Teeth. Cambridge Manuals in Archaeology, 2nd edition. Cambridge University Press 2005.

HORVÁTH, T. – DANI, J. – PETŐ, Á. – POSPIESZNY, Ł. – SVINGOR, É. 2013

Multidisciplinary contributions to the study of Pit Grave Culture kurgans of the Great Hungarian Plain. In: Heyd, V. – Kulcsár, G. – Szevevényi, V. (eds.): *Transitions to the Bronze Age. Interregional Interaction and Socio-Cultural Change in the Third Millennium BC Carpathian Basin and Neighbouring Regions*. Budapest 2013, 153–179.

IRIMIA, M. 1983

Date noi privind necropolele din Dobrogea în a doua epocă a fierului. *Pontica* XVI (1983) 69–148.

IRIMIA, M. 1999

Unelte de fier din așezarea getică fortificată de la Adâncata (com. Aliman, jud. Constanța). *Pontica* XXXII (1999) 71–82.

IRIMIA, M. 2004–2005

Descoperiri getice în zona Adâncata (com. Aliman, jud. Constanța). *Pontica* XXXVII–XXXVIII (2004–2005) 319–384.

IRIMIA, M. 2007

Considerații privind așezările getice din Dobrogea și problema existenței unor emporia în zona Dunării Inferioare. *Pontica* XL (2007) 137–225.

KAISER, E. – WINGER, K. 2015

Pit graves in Bulgaria and the Yamnaya Culture. *Prähistorische Zeitschrift* 90/1–2 (2015) 114–140.

KITOV, G. – PANAYOTOV, I. – PAVLOV, P. 1991

Mogilni nekropoli v Lovetshkia kraii. Ranna bronzova epoha. Nekropolat Goran-Slatina (Razkopki i Pruchvania 23). Sofia 1991.

KOLEDIN, J. – BUGAJ, U. – JAROSZ, P. – NOVAK, M. – PRZYBYŁA, M. – PODSIADŁO, M. et al. 2020

First archaeological investigation of barrows in the Bačka region and the question of the Eneolithic/ Early Bronze Age barrows in Vojvodina. *Praehistorische Zeitschrift* 95/2 (2020) 350–375.

- LEVİTKI, O. – MANZURA, I. – DEMCHENKO, T. 1996
Necropola tumulară de la Sărăteni. Biblioteca Thracologica XVII. București 1996.
- LOVEJOY, C. O. – MEINDL, R. S. – PRYZBECK, T. R. – MENSFORTH, R. P. 1985
 Chronological metamorphosis of the auricular surface of the ilium: a new method for the determination of adult skeletal age at death. *American Journal of Physical Anthropology* 68/1 (1985) 15–28.
- MANN, R. W. – HUNT, D. R. – LOZANOFF, S. 2016
Photographic regional atlas of non-metric traits and anatomical variants in the human skeleton. Charles C. Thomas Publisher, Ltd., Springfield 2016.
- MANZURA, I. 2016
 North Pontic steppes at the end of the 4th millennium BC: the epoch of broken borders. In: Zanoci, A. – Kaiser, E. – Kashuba, M. – Izbitser, E. – Băț, M. (eds.): *Mensch, Kultur und Gesellschaft von der Kupferzeit bis zur frühen Eisenzeit im Nördlichen Eurasien (Beiträge zu Ehren zum 60. Geburtstag von Eugen Sava)*. Tyragetia International I. Chișinău – Berlin 2016, 53–75.
- MARIOTTI, V. – FACCHINI, F. – BELCASTRO, M. G. 2007
 The study of entheses: proposal of a standardised scoring method for twenty-three entheses of the postcranial skeleton. *Collegium Antropologicum* 31/1 (2007) 291–313.
- MARTIN, R. 1928
Lehrbuch der Anthropologie in systematischer Darstellung mit besonderer Berücksichtigung der anthropologischen Methoden; für Studierende, Ärzte und Forschungsreisende, Zweite vermehrte Auflage, Bd. 2: Krianiologie, Osteologie, Verlag von Gustav Fischer, Jena 1928.
- MEINDL, R. S. – LOVEJOY, C. O. 1985
 Ectocranial suture closure: a revised method for the determination of skeletal age at death based on the lateral-anterior sutures. *American Journal of Physical Anthropology* 68/1 (1985) 57–66.
- MOTZOI-CHICIDEANU, I. 2011
Obiceiuri funerare în epoca bronzului la Dunărea mijlocie și inferioară. București 2011.
- MUNTEANU, I. – OPREA, V. 2007
 Periegeze pe malul Dobrogean al Dunării. *Pontica* XL (2007) 509–514.
- MYSZKA, A. – PIONTEK, J. 2012
 Variation of musculoskeletal stress markers in the medieval population from Cedynia (Poland) – proposal of standardized scoring method application. *Collegium Antropologicum* 36/3 (2012) 1009–1017.
- ORTNER, D. J. 2003
Identification of pathological conditions in human skeletal remains. 2nd Edition, San Diego 2003.
- AL-OUAOU, I. – JIMÉNEZ-BROBEIL, S. – DU SOUICH, P. 2004
 Markers of activity patterns in some populations of the Iberian Peninsula. *International Journal of Archaeology* 14/5 (2004) 343–359.
- PAPASIMA, T. – CHERA, C. 1999
 Sgraffiti feudale timpurii la Aliman (Constanța). *Pontica* XXXII (1999) 289–296.
- POPOVICI, S. – CIOBANU, I. – AGULNICOV, S. – NOROC, I. 2016
 Tumulul 8 de la Cimișlia. Considerații preliminare. *Arheologia preventivă în Republica Moldova* III (2016) 19–28.

PREDA-BĂLĂNICĂ, B. – FRÎNCULEASA, A. – HEYD, V. 2020

The Yamnaya impact north of the Lower Danube: A tale of newcomers and locals. *Bulletin de la Société préhistorique française* 117/1 (2020) 85–101.

RASSAMAKIN, Y. Y. 2013

Pokhovannia kvitianskoi kultury v konteksti absolutnoi khronologii. *Arkheologiya* 4 (2013) 17–41.

REIMER, P. – AUSTIN, W. – BARD, E. – BAYLISS, A. – BLACKWELL, P. – BRONK RAMSEY, C. et al. 2020

The IntCal20 Northern Hemisphere radiocarbon age calibration curve (0–55 cal kBP). *Radiocarbon* 62 (4) (2020) 725–757.

RÍOS, L. – WEISENSEE, K. – RISSECH, C. 2008

Sacral fusion as an aid in age estimation. *Forensic Science International* 180/2–3 (2010) 111.e1–111.e7.

ROGERS, J. – WALDRON, T. 1995

A field guide to joint diseases in archaeology. Chichester 1995.

RUFF, C. B. – HOLT, B. M. – NISKANEN, M. – SLADÉK, V. – BERNER, M. – GAROFALO, E. et al. 2012

Stature and body mass estimation from skeletal remains in the European Holocene. *American Journal of Physical Anthropology* 148/4 (2012) 601–617.

SCHAEFER, M. – BLACK, S. – SCHEUER, L. – CHRISTIE, A. 2009

Juvenile osteology: a laboratory and field manual. Elsevier, Academic Press, Burlington, MA, 2009.

SCHUSTER, C. – MORINTZ, A. – KOGĂLNICEANU, R. – ȘTEFAN, C. – COMȘA, A. – EL-SUSI, G. et al. 2011

Cercetările arheologice de pe tronsonul Cernavodă-Medgidia al Autostrăzii A2. Tumulul nr. 3. Târgoviște 2011.

SCORPAN, C. 1973

Săpăturile arheologice de la Sacidava 1969, 1970, 1971. *Pontica* VI (1973) 267–331.

SCORPAN, C. 1974

Mormânt getic de epocă romană la Aliman. *Pontica* VII (1974) 239–246.

SCORPAN, C. 1978

Descoperiri arheologice diverse de la Sacidava. *Pontica* XI (1978) 155–180.

SHIRLEY, N. L. – JANTZ, R. L. 2010

A bayesian approach to age estimation in modern americans from the clavicle. *Journal of Forensic Sciences* 55/3 (2010) 571–583.

SIMALCSIK, A. – SIMALCSIK, R. D. 2013

Anthropological analysis of the human osteological remains discovered in the tumular cemetery from Cernavodă - A2 highway (tumuli nos. 7, 7a, 7b). *Thraco-Dacica* S.N. IV–V (XXVII–XXVIII) (2013) 5–32.

TALMAȚCHI, G. 1994

Noi descoperiri monetare în satul Adâncata (jud. Constanța). *Pontica* XXVII (1994) 231–233.

TOPAL, D. – VORNIC, V. – POPOVICI, S. 2019

Considerații preliminare asupra peisajului tumular de pe teritoriul Republicii Moldova. *Arheologia preventivă în Republica Moldova* IV (2019) 6–26.

TURNER II, G. C. – NICHOL, C. R. – SCOTT, G. R. 1991

Scoring procedures for key morphological traits of the permanent dentition: the Arizona State University dental anthropology system. In: Kelley, M. A. – Larsen, C. S. (eds.): *Advances in dental anthropology*. Wiley-Liss, Inc., New York 1991, 13–31.

UBELAKER, D. H. 1978

Human skeletal remains-excavation, analysis, interpretation, Manuals on archaeology. 1st edition, Aldine Pub. Co, Chicago 1978.

VERTAN, A. – CUSTUREA, G. 1995–1996

Descoperiri monetare în Dobrogea (X). *Pontica* XXVIII–XXIX (1995–1996) 309–321.

VISSER, E. P. 1998

Little waifs: estimating child body size from historic skeletal material. *International Journal of Osteoarchaeology* 8/6 (1998) 413–423.

WŁODARCZAK, P. 2020

Sequence of graves in barrows 4th–3rd millennium BC in the Danube-Tisza region. *Pontica* LIII (2020) 135–155.

More about a particular group of Early Bronze Age barrow graves in Hocker position from North-East Bulgaria

STEFAN ALEXANDROV

Abstract

Eleven Early Bronze Age barrow graves from North-East Bulgaria – relaxed hocker inhumations with arms bent at the elbows, both palms in front of the head/torso – are discussed. They were primary graves for their respective barrows (relatively small in size), stratigraphically followed by inhumations in supine position with flexed legs that are related to Yamna populations. Ten of eleven graves were single graves, buried were persons of both sexes and all ages, with the orientation of the body following the west-east axis. Red ochre and grave inventory are relatively well represented in the graves as well. According to six radiocarbon dates, their chronological position is secured to 3400/3300–2900 cal BC period.

Similar grave assemblages are to be found in North Dobroudja, Muntenia (Prahova region), Central-North and North-West Bulgaria (Goran-Slatina, Tarnak, Tarnava) and Upper Thrace (Boyanovo). The westernmost grave of that group was found in Sárrétudvari-Órhalom (Hungary). In the North-Pontic region, such graves were included in the “Zhivotilovka-Volchanskoe-Bursuceni” group and considered to be in the same chronological and stratigraphic position as the ones discussed here.

For 3400/3300–3100 cal BC relaxed hocker graves in North-East Bulgaria a possible relation to the Cernavodă III and Usatovo phenomena is argued. The post-3100 BC relaxed hocker graves are considered to be related to local populations as well.

Key words: 4th–3rd millennia BC, barrow graves, Lower Danube region, North-Pontic region, Cernavodă III, Usatovo, Zhivotilovka graves, Yamna graves

Introduction

During the last decades, the number of Early Bronze Age (EBA) barrow graves investigated in the eastern part of the Northern Balkans has rapidly grown. In North Bulgaria only, their number reached 200. Those graves presented a large variety of mortuary practices, most of all considering the position of the body in the grave – extended, supine with flexed legs, semi-supine with flexed legs, different crouched/hocker positions, or only parts of the body were buried. Additionally, more than one third of the graves in discussion has been dated by radiocarbon samples showing chronological/spatial coexistence of different body positions in different micro-regions.

On the other hand, in Muntenia and the North-Pontic regions groups of barrow graves with inhumations in crouched/hocker positions have been identified, dated prior to 3100/3000 BC period i.e. belonging to pre-Yamna populations. While in Muntenia (Prahova region) those graves were related to local Baden/Coțofeni groups (FRÎNCULEASA 2020a), in the North-Pontic area they were interpreted as belonging to the “Zhivotilovka-Volchanskoe-Bursuceni” group. The nature of the appearance and development of this group is still uncertain, with different approaches being applied for analysing the

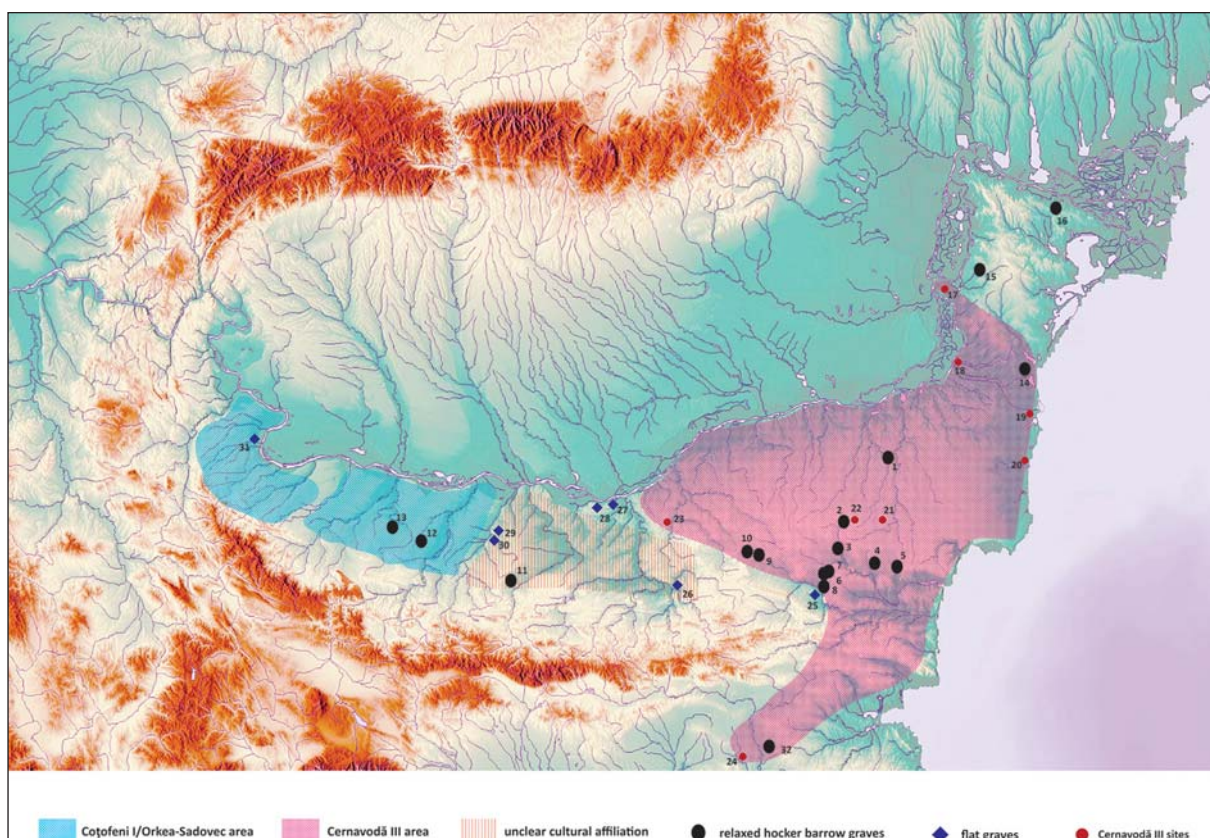


Fig. 1. Sites mentioned in text. 1. Kamentsi, 2. Pet mogili, 3. Vetrino, 4. Belogradets, 5. Pliska, 6. Kalugeritsa, 7. Madara, 8. Kiulevcha, 9. Ralitsa, 10. Chudomir, 11. Goran-Slatina, 12. Tarnak, 13. Tarnava, 14. Anadolkiioi, 15. Rahmani, 16. Tulcea, 17. Hârșova, 18. Cernavodă, 19. Tuzla, 20. Durankulak, 21. Brestak, 22. Mirovtsi, 23. Koprivets, 24. Drama, 25. Smyadovo, 26. Dzhulyunitsa, 27. Batin, 28. Svishtov, 29. Telish-Laga, 30. Ezero-Kaleto, 31. Tarnyane, 32. Boyanovo

problem (most recently in RASSAMAKIN 2021). Such graves are known from North Bulgaria and, even from Thrace as well. Their presence is of particular interest considering the fact that they appear in the same micro-regions or in barrows in which Yamna graves were found as well. The present analysis will focus on the northeastern lot of Bulgarian graves – the most numerous one, also providing more reliable information.

The graves in discussion form a particular group – relaxed hocker inhumations with arms bent at the elbows, both palms in front of the head or one of them in front of the torso. The group from North-East Bulgaria comprises 11 barrow graves as follows (Fig. 1): Kamentsi – barrow 1, grave 5 (Fig. 2.1); Pet mogili – barrow 3, grave 4 (Fig. 3.3–4); Vetrino 2 – barrow 7, grave 1 (Fig. 3.2); Belogradets – barrow 3, grave 2 (Fig. 2.6); Pliska-West – barrow 27, grave 1 (Fig. 3.1); Kalugeritsa – barrow III, grave 4; Madara – barrow 2, grave 2 and barrow 4, grave 4; Kiulevcha – barrow I, grave 3; Ralitsa – barrow 1, feature 1 (Fig. 2.7) and Chudomir – barrow 1, feature 17 (Fig. 2.3–5).¹

¹ All the data and references regarding the respective graves are presented in the Catalogue at the end of the text.



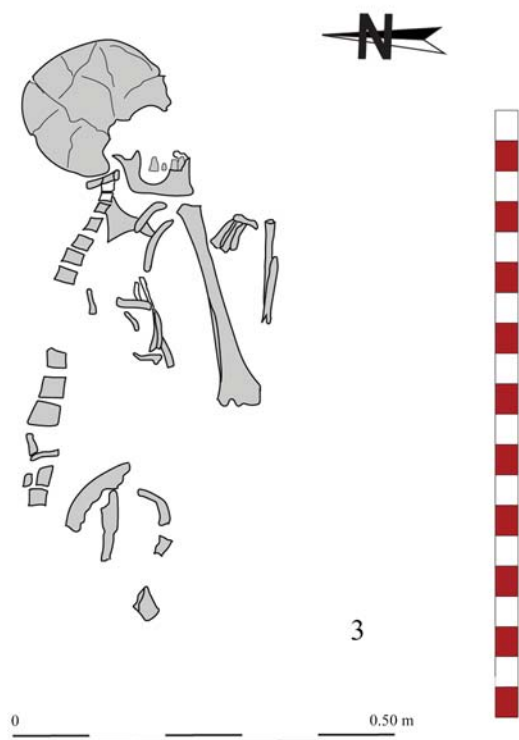
Fig. 2. Relaxed hocker graves from Northeast Bulgaria. 1. Kamentsi necropolis, barrow 1, grave 5, 2. Silver hair ring from Kalugeritsa necropolis, barrow III, grave 4, 3–5. Chudomir, barrow 1, feature 17, 6. Belogradets necropolis, barrow 3, grave 2, 7. Ralitsa, barrow 1, feature 1



1



2



3



4

Fig. 3. Relaxed hocker graves from Northeast Bulgaria. 1. Pliska-West necropolis, barrow 27, grave 1, 2. Vetrino 2 necropolis, barrow 7, grave 1, 3–4. Pet mogili necropolis, barrow 3, grave 4

Stratigraphic observations

The discussed graves were the only ones in Pliska-West and Ralitsa cases. However, it should be noticed that the two barrows were not completely excavated. In Pet mogili, the grave under discussion was the only EBA grave, but the barrow was reused in later periods that might have affected other BA graves. In three barrows, stratigraphically next come inhumations in supine position with flexed legs. In Chudomir, these were two graves dated to the 3100–2900 cal BC period. The barrow was enlarged and encircled with a stone cromlech. The last in the EBA sequence were six inhumations in semi-supine positions (dug into the barrow fill, but without additional piling of barrow fills) dated to the 2900–2650 cal BC period (ALEXANDROV 2020b). Although without a clear stratigraphic order established, the barrows from Kiulevcha, Madara, barrow 2, and Kamentsi presented a similar sequence, i.e. relaxed hockers as primary graves – supine inhumations with flexed legs as secondary graves. In Kamentsi, Vetrino, and Belogradets, secondary were graves in hocker/semi-supine position with one arm alongside the body. In Kalugeritsa and Madara barrow III, stratigraphically the relaxed hocker graves were followed by extended inhumations with no certain date.

Chronological position of the group

Currently, we have at our disposal six radiocarbon dates related to the grave lot, all of them coming from human skeletal remains (*Figs. 4 and 10*). Two dates are earlier – Pliska-West and Chudomir that, with great probability enter the 3339–3012 cal BC and 3333–3011 cal BC period respectively.² Three of the AMS dated graves (Kamentsi, Belogradets, and Vetrino) enter 3105–2912 cal BC, 3093–2912 cal BC, and 3029–2912 cal BC period respectively. The latest grave from the lot seems to be the Ralitsa one, entering the 3013–2901 cal BC timespan. Generally, the chronological position of the discussed graves in 3300–2900 cal BC seems quite tenable. The grave goods, although not very sensitive chronologically, do not contradict the time-period proposed; for the Pet mogili amphora even an earlier date is being discussed (ALEXANDROV – KAISER 2016, 365).

The graves discussed present some common features that could be outlined as follows:

- All graves from this group were *primary* for their respective barrows;
- The barrows themselves were *relatively small* - around 20 m in diameter, rarely exceeding 1 m in height;
- The grave facilities (with one exception – Kiulevcha, barrow 1) were *rectangular pits*; it seems that most of them had *steps*; more than half of the pits were covered with wooden planks/tree barks; the pit floor covering is mentioned for Pliska-West, Plachi dol, and Kalugeritsa graves;
- The *use of stones* in mortuary practices is to be mentioned as well (in 3 of 11 features) such as rings of stones around the graves (Kalugeritsa and Kiulevcha) or, encircling the grave-pit with stones (Vetrino);
- Ten of eleven features were *single* graves;
- Buried were persons of *both sexes* – 5 females, 3 males, and 1 infant; in Belogradets, male individual with 2 infants were buried;
- Buried were persons of *all ages* – from *infans I* to *maturus* age groups, with predominance of the adult persons buried;

² The dates were calibrated with OxCal 4.4.4 program using the IntCal20 curve. All dates are presented in the 95.4% probability range.

- The bodies were placed in **relaxed hocker position** (on their right – 81.8% or left side – 18.2%), the angle formed between the spinal column and the femurs being around or bigger than 90°; the arms were bent at the elbows, with both palms in front of the skull or one of them in front of the torso;
- The orientation of the body is in **west–east axis**, with the head predominantly in the western sector;
- Six skeletons had **red ochre** over the bones, especially in the skull area; in two graves lumps of ochre were found near the skeletons;
- Three graves contained **grave inventory** – clay vessel (Pet mogili); golden hair-ring and flint core (Chudomir) and silver ring (Kalugeritsa). Animal bones were found in Belogradets grave.
- The chronological position of the group is, generally, between 3300–2900 cal BC.

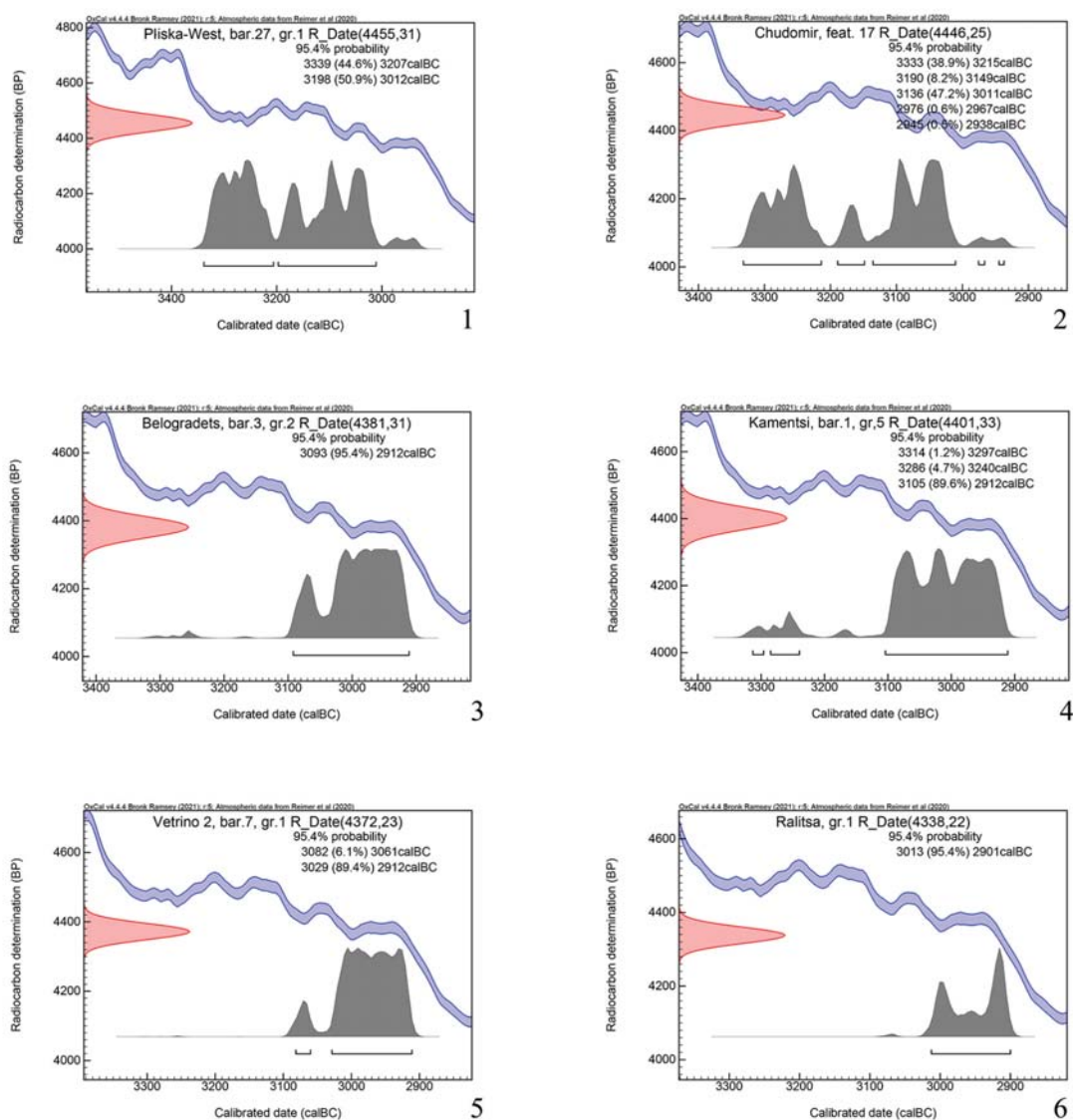


Fig. 4. Relaxed hocker graves from North Bulgaria. Radiocarbon dates. 1. Pliska-West necropolis, barrow 27, grave 1, 2. Chudomir; barrow 1, feature 17, 3. Belogradets necropolis, barrow 3, grave 2, 4. Kamentsi necropolis, barrow 1, grave 5, 5. Vetrino 2 necropolis, barrow 7, grave 1, 6. Ralitsa, barrow 1, feature

The relaxed hocker graves in North Dobroudja (Figs. 1 and 5)

Relaxed hocker barrow graves, very similar to the North-East Bulgarian ones, are known from North Dobroudja as well – Anadolkiöi, barrow 2 (SCHUCHARDT – TRAEGER 1918, 152–153); Rahman, barrow 2 (AILINCĂI *et al.* 2016, 35–36, fig. 7) and Tulcea – sud, barrow 1 (SIMION 2003, 17, fig. 3). All three graves were primary for their respective barrows. Unfortunately, no radiocarbon dating for these features is available. Considering the lack of grave inventory as well, for now a *terminus ante quem* for their chronological position could only be established, i.e. the dating of the secondary grave (no. 5) from Rahman – 2570–2340 cal BC (AILINCĂI *et al.* 2016, 35–36). In fact, similar graves could have been found in Zebil, barrow 3 (SIMION 2003, 21–22) and Enisala, barrow 5 (VASILIU 2004, 125–126), for example, but due to some discrepancies in the original publications, they will not be discussed here. What is relevant is that such graves existed in North Dobroudja as well and, most probably, they are to be dated in the same period as the above-presented ones.

The relaxed hocker graves in Muntenia (Fig. 5)

EBA barrow graves in relaxed hocker position were also found in Muntenia. Similar graves have been investigated in Păulești II and Păulești III barrows, for example (FRÎNCULEASA – PREDA – HEYD 2015, Pl. 10; 11). In those regions and, especially in the Ploiești area, they appear as primary graves in “... small tumuli, no more than one meter high”, in “...individual, double or collective graves, with post-

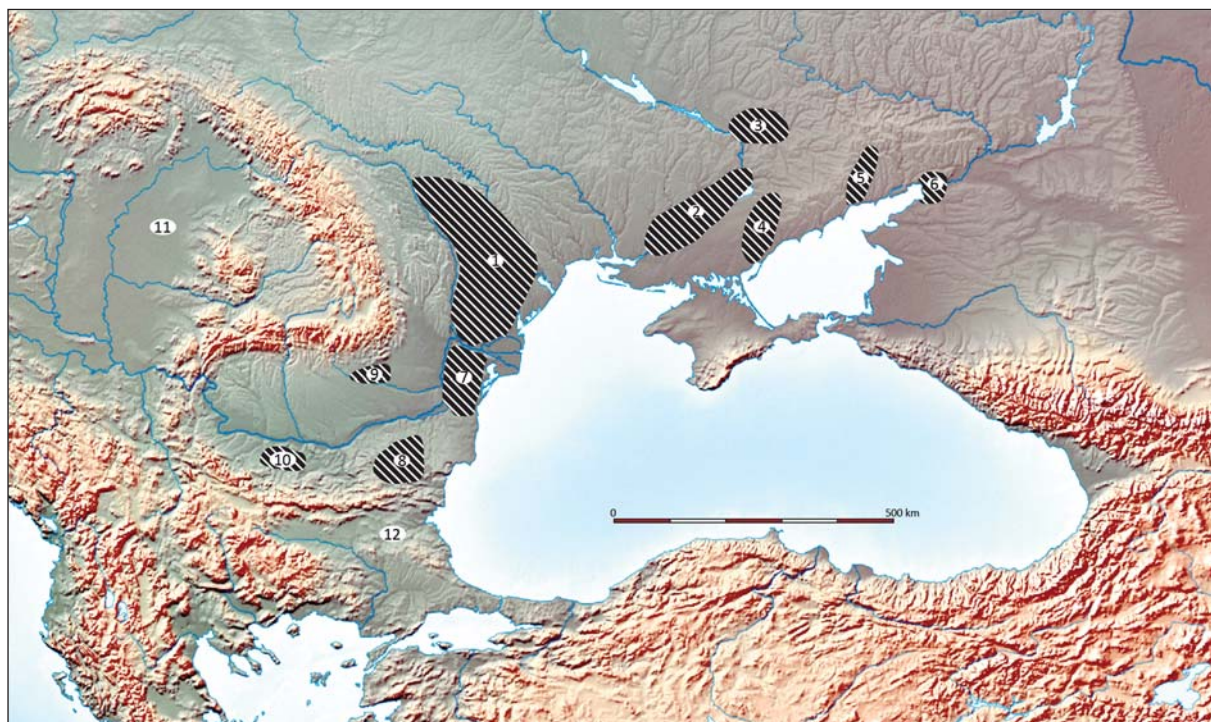


Fig. 5. 1–6. Zhivotilovka-Volchanskoe graves (after RASSAMAKIN 2021) 1. Prut-Dniester group, 2. Dnieper-Ingulets group, 3. Samara group, 4. Molochnaya group, 5. Kal'mius group, 6. Lower Don group, 7. North Dobroudja relaxed hocker graves, 8. North-East Bulgaria relaxed hocker graves, 9. Prahova relaxed hocker graves group, 10. Central- and North-West Bulgaria relaxed hocker graves, 11. Sárrétudvari-Örhalom barrow; 12. Boyanovo barrow

mortem manipulation of bones” (FRÎNCULEASA 2021, 187–188). The use of red ochre and stones in mortuary practices and the richness of the grave goods (related to Baden/Coțofeni cultural block) are to be mentioned as well. Those graves are considered to be of local origin and defined as pre-Yamna, dating to the 3300–2900 cal BC period (FRÎNCULEASA – PREDA – HEYD 2015, 35–38; PREDA-BĂLĂNICĂ – FRÎNCULEASA – HEYD 2020, 91; FRÎNCULEASA 2021).

The relaxed hocker graves in the western part of the Lower Danube (Figs. 1 and 5)

Such graves are known in the western part of the Lower Danube region as well. From Central-North and North-West Bulgaria four graves match the above-mentioned characteristics as follows: Goran-Slatina – Barrow VII, grave 5 (Fig. 6.4–5); Tarnak – *Ninovska barrow*, grave no. 2 (Fig. 7.4); Tarnava – *Glavchovska barrow*, graves nos. 1 and 4 (Fig. 8).³ The use of red ochre is mentioned for all the graves; grave inventory – clay vessels were found in the two Tarnava graves. The stratigraphic data for the four graves show a similar picture as in the other regions discussed: these are primary graves, stratigraphically followed by inhumations in supine position with flexed legs. In the absence of ¹⁴C dates, the chronological position of the Tarnava graves can only be established using their grave inventory. The pottery from the two graves (Fig. 8.1–4) is related to Coțofeni Culture, phases II–III (ALEXANDROV 2019). Three recently obtained and still unpublished ¹⁴C -AMS dates related to these phases in North-West Bulgaria come from Gradets settlement, level I (Vidin region) related to Coțofeni III phase – SUERC-87793: 4322±30 BP and Rasovo, site 2002 (Montana region) – SUERC-92422: 4300±28 BP and SUERC-92423: 4395±28. The dates are coming from two pits related to the Coțofeni Culture, phases II–III (Fig. 9).⁴ These dates fully correspond to the ones obtained for Coțofeni III in Transylvania (DIACONESCU 2020, 32; CIUGUDEAN – QUINN – UHNÉR 2022). According to these data, the chronological position of Tarnava hockers should generally be positioned in the 3100–2900 BC timespan. The date of the other two graves – Tarnak and Goran-Slatina is currently uncertain. North of the Danube river, in Oltenia, such graves are currently unknown but this could be a result of the relatively limited number of EBA barrows investigated there (PREDA-BĂLĂNICĂ – FRÎNCULEASA – HEYD 2020, 86, Table 1) or, of the lack of available information.

Such graves are known even further west, east of Tisza River – in Sárrétudvari-Őrhalom barrow, grave no. 12 – primary and grave no. 10 – secondary. The calibrated radiocarbon dates (Fig. 10) from the graves enter 3365–3095 cal BC and, 3092–2893 cal BC periods respectively (DANI – NEPPER 2006, 35–39, 44, 48; fig. 7/2, 8/2).

The relaxed hocker graves in Upper Thrace (Figs. 1 and 5)

So far, south of the Balkan range only two such barrow graves, out of more than 200 investigated (ALEXANDROV 2020a) are known. They both come from the Yambol region, Boyanovo-*Baylar kayryak*, barrow 1. The first grave, labeled as no. 19 in the barrow graves sequence, was an inhumation of an adult individual (no sex determination) in relaxed hocker position to the right, head in the eastern sector. Both arms were bent at the elbows, the right palm – in front of the skull, the left one – in front of the torso.

³ All the data and references regarding the respective graves are presented in the Catalogue at the end of the text.

⁴ The Gradets site was excavated in the 1980's by Ana Iotsova and still remains unpublished. The author would like to express his gratitude to Dr. Kalin Madzarov (National Archaeological Institute with Museum - Sofia) for kindly giving permission to use the results of his excavations at Rasovo.



Fig. 6. Goran-Slatina necropolis, barrow VII. 1. Grave 3, 2. Grave 4, 3. Grave 1, 4–5. Grave 5
(after KITOV – PANAYOTOV – PAVLOV 1989)

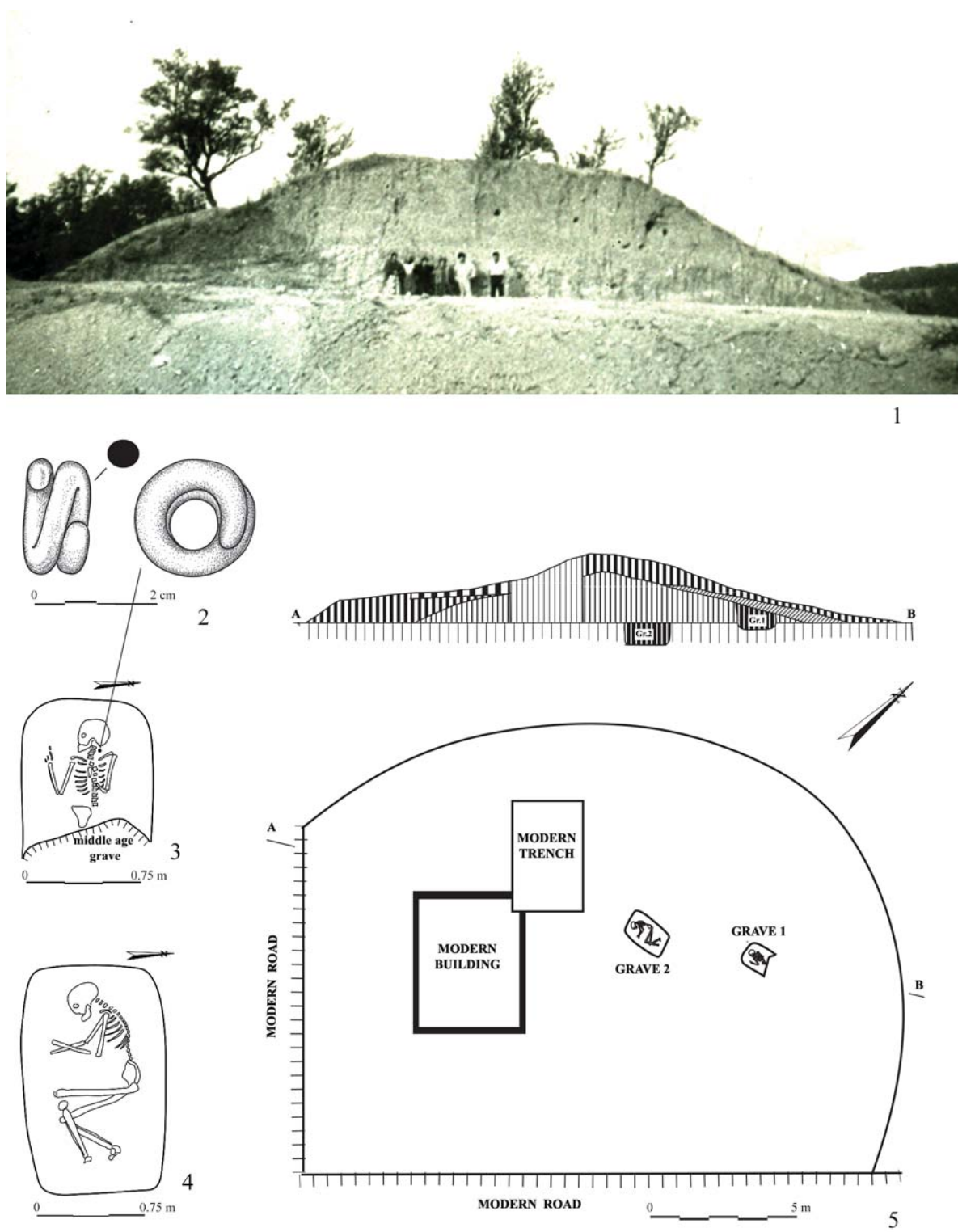


Fig. 7. Tarnak barrow. 1. Photo from the excavations, 2–3. Grave 1, 4. Grave 2, 5. Horizontal plan and section of the EBA graves (after ALEXANDROV 2019)

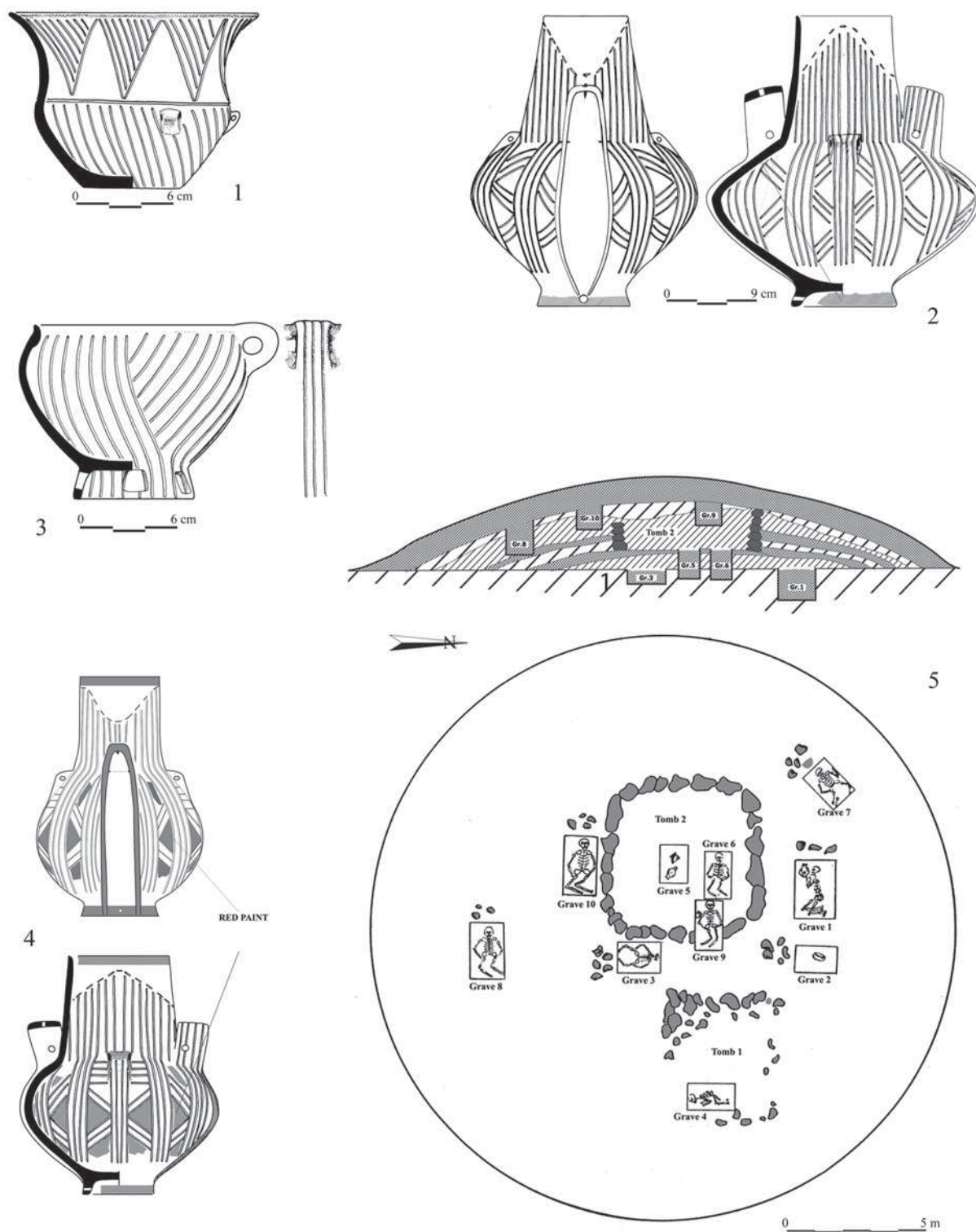


Fig. 8. Tarnava necropolis, "Glavchovska barrow". 1. Vessel from grave 4, 2. Vessel from grave 1, 3–4. Vessels from grave 5, 5. Horizontal plan and section of the EBA graves (after ALEXANDROV 2019)

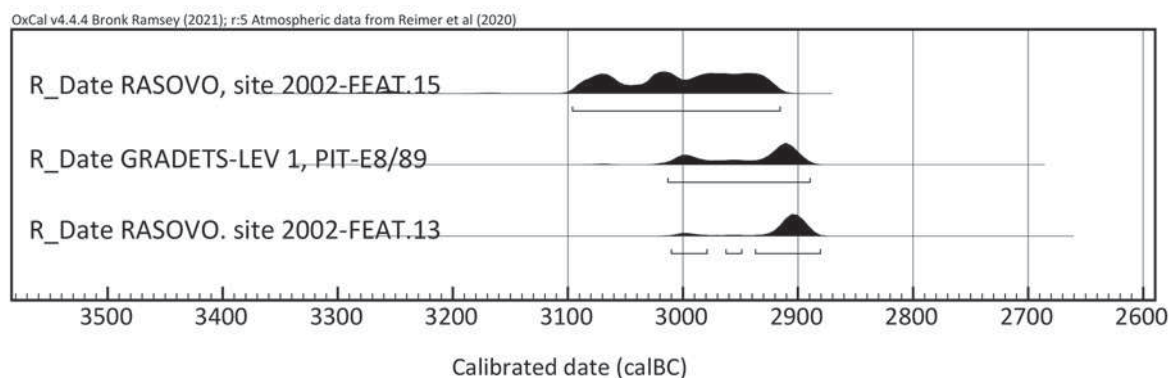


Fig. 9. Calibrated radiocarbon dates from Coțofeni II–III sites in North-West Bulgaria

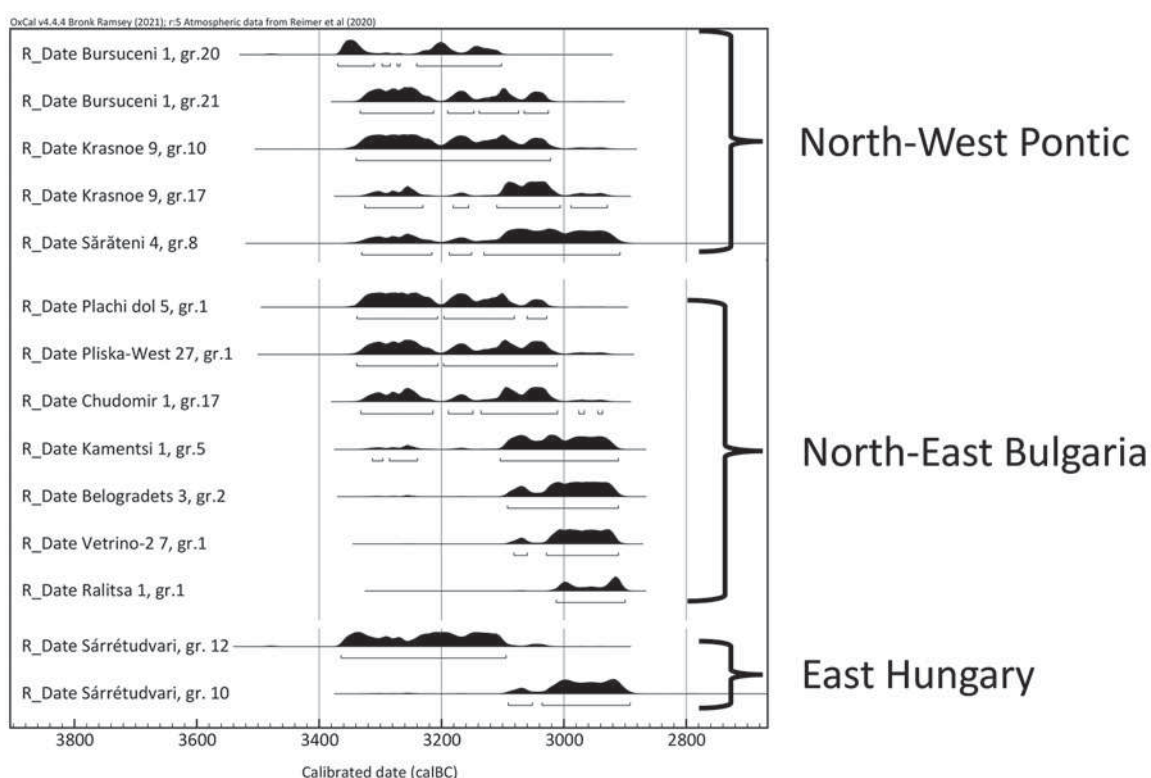


Fig. 10. Relaxed hocker graves from North Pontic region, Lower Danube region and Hungary.
Calibrated radiocarbon dates

Red ochre was spread over the skull, upper and lower limbs (Fig. 11.2). In the same grave-pit, some 0.30 m below the skeleton described above, another grave was found, labeled as no. 20. It contained the skeleton of an adult female (25–30 years old) arranged in the same position (head to the west), both arms bent at the elbows and placed in front of the torso. In the feet area, scattered bones of a child (4–5 years old) were placed (Fig. 11.1, 3). Red ochre was spread over the bones as well. No inventory was found in both graves. The original barrow fill covered those two graves. It was made of stones, with oval form with 6.20 by 8.10 m diameters and 1.30 m height. Stratigraphically, next in order come seven graves

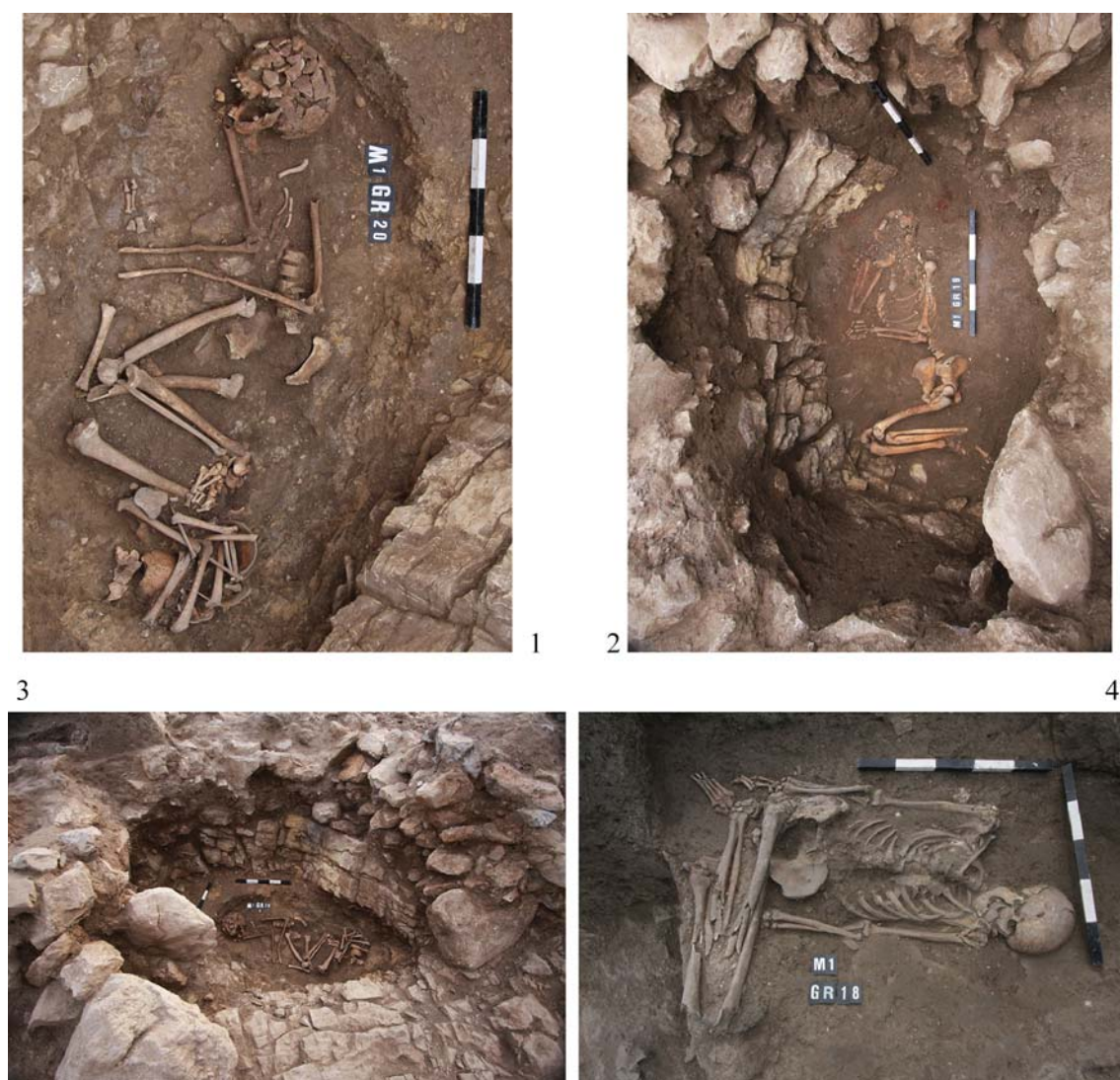


Fig. 11. Boyanovo, “Baylar kayryak”, barrow 1. Graves nos. 18, 19, and 20
(after ILIEV – BAKĀRDŽIEV 2020; PRIVAT *et al.* 2018)

with supine inhumations with flexed legs and additional piling of barrow fills (ILIEV – BAKĀRDŽIEV 2020, 24–27; taf. 41–57; PRIVAT *et al.* 2018, 182–184). Considering the stratigraphic sequence, the chronological position of both relaxed hocker graves should be considered earlier than the one of the supine graves. The earliest date from that group was provided by grave no. 18 (Fig. 11.4). The calibrated AMS date from there enters the 3099–2938 cal BC period (ALEXANDROV – WŁODARCZAK 2022, 234) that should be considered as a *terminus ante quem* for the relaxed hocker graves from the barrow.

Two more flat graves come from Yunatsite tell (western part of Upper Thrace). They were related to the first BA building level there – XVI/XVII–1. In both graves, adult individuals were buried (male – in grave no. 55 and female – in grave no. 52). The position of the deceased was hocker to the right, arms bent at the elbows with palms in front of the abdomen. Both grave-pit floors were covered with organic mats. The female grave revealed two silver rings, a bronze (?) awl and a jug as grave inventory (MISHINA – BALABINA 2007, 169–173). The absolute dating of the graves could be established by a radiocarbon

date from level XVI/XVII (IGAN-2794: 4380±70 BP) that, calibrated, enters 3333–2889 cal BC period (BOJADZHEV 2007, 220).

The relaxed hocker graves in North-Pontic area (Figs. 5 and 10)

Since the 1970s and, especially in the last 20 years, the appearance and nature of the relaxed hocker barrow graves in the North-Pontic area have been largely discussed. They were described as inhumation barrow graves in “...crouched position on one side with the arms bent and the hands in front of the face” (RASSAMAKIN 2021, 195). The group is known under different denominations, such as “Zhivotilovka-Bursuceni”, “Zhivotilovka-Volchanskoe” or “Zhivotilovka-Volchanskoe-Bursuceni” (BURTĂNESCU 2002, 390–391; RASSAMAKIN 2004, 55–59, 208–209; 2021; DEMCHENKO 2016; MANZURA 2016). In its frame, six local groups have been distinguished, nos. 2 to 6 located north of Azov Sea; group 1 (called “Prut-Dniester group”) being geographically the nearest to the graves discussed here, reaching the Danube-river delta (RASSAMAKIN 2021, 152, fig. 1). Recently, more than “...90 kurgans with about 150 burials” have been assigned to that group. With the exception of four barrows, “...almost total absence of stone structures in the form of cromlechs, cairns, a dome-shaped coating of the mound” is mentioned (MANZURA 2016, 153, fig. 1). Another specific element of the mortuary practices is the richness of the grave inventory – necklaces, pendants, tools, etc. Vessels were discovered in more than 50% of the graves, including painted Tripolye C2 pottery (MANZURA 2016, figs. 5–7; RASSAMAKIN 2021, figs. 3–5, 7).

Stratigraphically, “Zhivotilovka-Volchanskoe-Bursuceni” graves are, as a rule, later than the Late Chalcolithic graves and precede the Yamna ones. At the beginning of the 21st century, these graves were included by Y. Rassamakin in his group IIIC of the Eneolithic graves in the North-Pontic region, dated to 3500/3400–3000/2900 BC (RASSAMAKIN 2004, 55–59). Recently, the absolute dating of those graves in the Dniester-Prut area was secured by several radiocarbon dates – from Bursuceni, barrow 1, graves 20 and 21; Sărăteni, barrow 4, grave 8; Krasnoe, barrow 9, graves 10 and 17; Cimișlia, barrow 8, graves 2 and 8. According to them, the chronological position of the group is in the last third of the 4th millennium BC (MANZURA 2016; DEMCHENKO 2016) or “...the second half of the 4th millennium BC” (POPOVICI *et al.* 2015; POPOVICI – KAISER 2020, 73–74).

Relations to the other groups

Some of the hocker groups presented here have already been the subject of discussion regarding their cultural affiliation. The graves from Prahova region are considered to be of local origin and related to Baden/Coțofeni populations (FRÎNCULEASA 2020a; PREDA-BĂLĂNICĂ – FRÎNCULEASA – HEYD 2020). Grave no.12 from Sárretudvari-Örhalom barrow, alongside grave no.3 from Püspökladány-Kincsesdomb are considered to be pre-Yamna graves, “...which in part conform to the mortuary rites of the local Late Copper Age Baden culture and in part to those of the late Eneolithic Lower Mikhailovka culture” (DANI 2020, 48–49). The situation with Zhivotilovka-Volchanskoe-Bursuceni graves is more complicated. Different approaches have been applied when searching the origin and nature of that particular mortuary practice there. As I. Manzura wrote “...the very complex combination of different cultural traits in the burial sites of the Zhivotilovka type is able to generate certain problems in the search for the origins of this phenomenon” (MANZURA 2016, 167). Such have been sought in Gordinești (DEMCHENKO 2016),

Usatovo and, especially in Maykop-Novosvobodnaya cultural circles (MANZURA 2016; RASSAMAKIN 2021; POPOVICI 2015).

Generally, the cultural development in *North-East Bulgaria* and *North Dobroudja* during the 4th millennium BC is considered to be related to Cernavodă phenomena, the first half of the period being associated with Cernavodă I (MANZURA 1999), while the second half of the millennium with Cernavodă III presence (TODOROVA 2011). In fact, currently only four sites with Cernavodă III materials are known from North-East Bulgaria (*Fig. 1*): Koprivets (NIKOLOVA 1999, fig. 8.2/1, 2, 5)⁵, Mirovtsi (ZMEYKOVA 2001), Brestak⁶, and Durankulak (DRAGANOV 1990). Cernavodă III sites near Kavarna, Kragulevo and Dalgopol were mentioned by Henrieta Todorova but no archaeological materials have been published from there (TODOROVA 2011, 102). Finally, three more sites are known from North Dobroudja – Cernavodă, Hârşova, and Tuzla (OANȚĂ-MARGHITU 2003, Plate 1). None of these sites provided radiocarbon dates. A Cernavodă III site south of the Balkan range could be of some use – Drama, with absolute dating in the 3600–3100 cal BC period (GLESER 2011, Abb. 7). Additional support for dating the Cernavodă III in the second half of the 4th millennium BC comes from the Usatovo circle dated, generally, in the same period (DIACHENKO – HARPER 2016). Recently, a narrower chronological position for Usatovo, i.e. Cernavodă III group as well, in the third quarter of the 4th millennium BC has been argued (MANZURA 2020, 75–76). Usatovo elements in the mortuary practices are clearly visible in some barrows from the northern part of Dobroudja – Luncavița-*Drumul vacilor*, barrow I, or the graves with a cairn of stones and rings of stones from Mihai Bravu, Murighiol or Tariverde (ALEXANDROV 2011). It should be mentioned here that at least two barrow graves with inhumations in supine position with flexed legs – Belogradets, Barrow 1, grave 2 and Riltsi, Barrow 264, grave 4 provided ¹⁴C-AMS dates that, calibrated, could enter a period earlier than 3100 BC.

The 3100–2500 BC period in North-East Bulgaria and North Dobroudja is to be related to what has been called by Petre Roman the “West Pontic Cultural Circle” with its core being the Varna-lakes sites (ROMAN – DODD-OPRIȚESCU – JÁNOS 1992). “Ezerovo” manifestations were recognised in some regions north of the Danube-river as well (MOTZOI-CHICIDEANU 2011, 285–288). Batin (STANCHEV 1989) and Smyadovo graves (CHOHADZHIEV – MIHAYLOVA 2014), in my opinion, could also be related to this phenomenon. During this period, large parts of the area discussed were settled by Yamna populations (PANAYOTOV 1989; HEYD 2011, 536; ALEXANDROV 2021). In its northern part “...a chronological/spatial correlation between “Cernavodă II” and “Yamna phenomena” is to be seen (ALEXANDROV – SLAVCHEV – TONKOVA 2021, 73). Recently, an even earlier date than 3100 BC for the appearance of Cernavodă II has been argued (FRÎNCULEASA 2020b, 150–158). During the EBA, the “borders” of this arid region are marked by flat single and multiple graves; the “inside” territories – by barrow graves, with inhumations in supine position with flexed legs, semi-supine, hocker and extended position (ALEXANDROV – SLAVCHEV – TONKOVA 2021; ALEXANDROV 2021a).

Cernavodă III sites are still missing in *Central North* and *North-West Bulgaria*. In the North-West, the 3300–3100 BC period is associated with Coțofeni I Culture, best illustrated by Magura cave materials (*Fig. 12*). East of Coțofeni I area, pottery related to the so-called “Orlea-Sadovec” group – vessels decorated with lines of holes beneath the rim are known (ROMAN 1976). During the last decades, such materials came from Telish (MERKYTE 2007, Pl. 13), Krushovitsa (IVANOV – ZIDAROV – DYAKOV 2014), etc. (*Fig. 13*). Grave No. 9, barrow III from Goran-Slatina necropolis – an inhumation in semi-supine position to the left, with red ochre over the bones as well as “...relatively big quantity of ochre in the grave”, including “...pieces of considerable size”, should be discussed here as well. The grave-pit was

⁵ Some of the materials published as Cernavodă III in fact date to the MBA (NIKOLOVA 1999, fig. 8.2/3) and LBA-EIA periods (NIKOLOVA 1999, fig. 8.2/4).

⁶ Rescue excavations in 2021 directed by Hristo Kuzov from Varna Archaeological Museum.

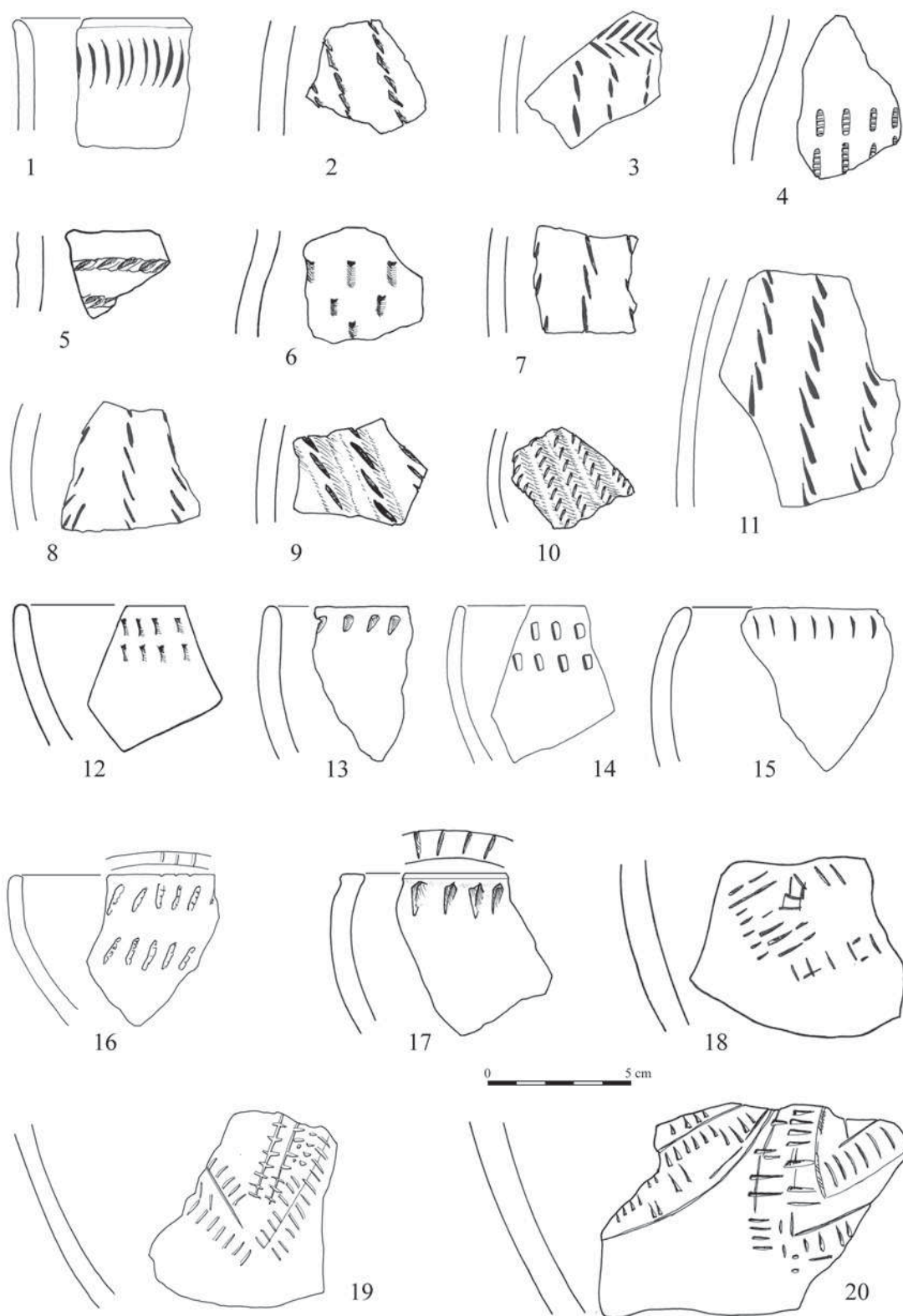


Fig. 12. Magura cave. Coțofeni I pottery (drawings S. Alexandrov)

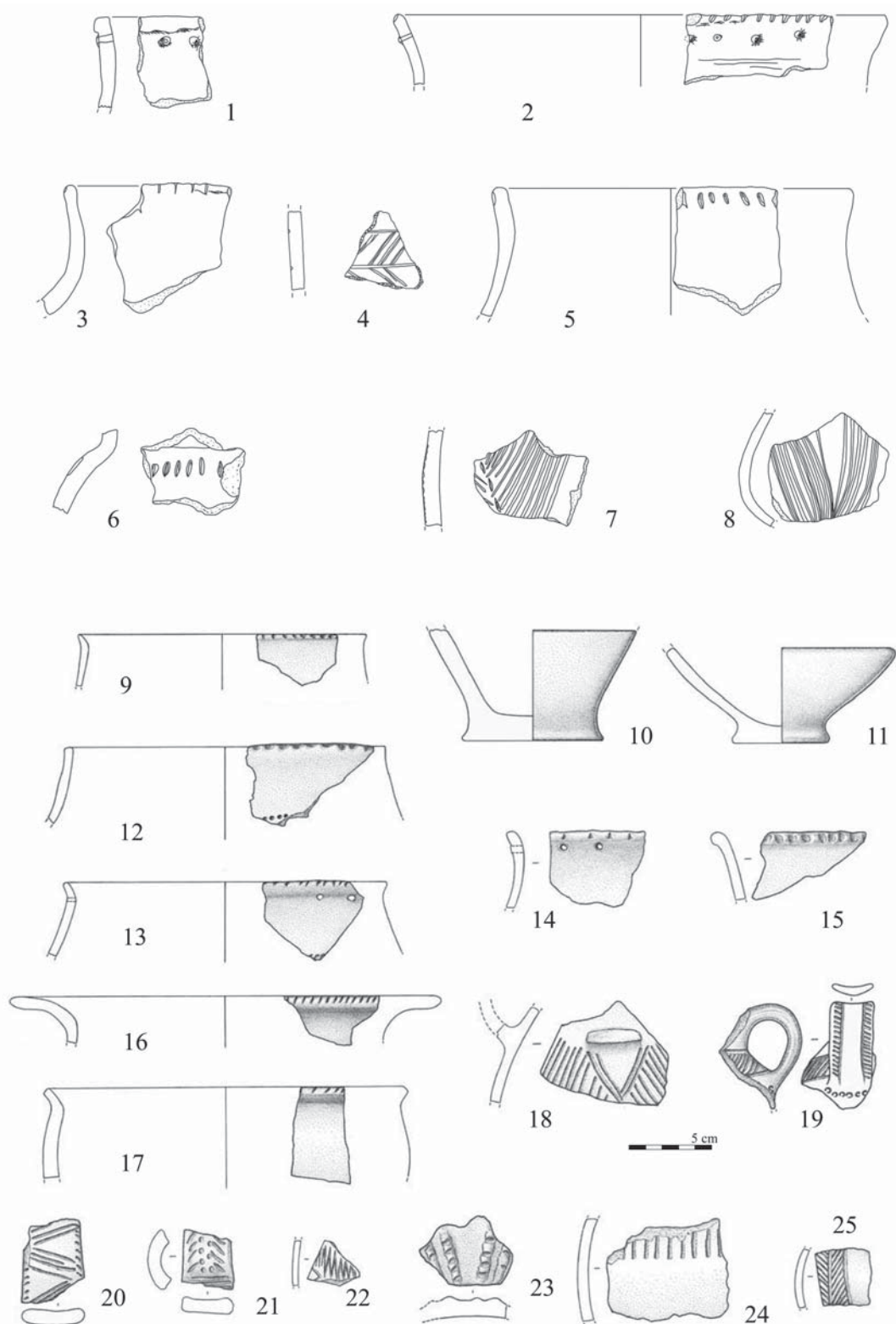


Fig. 13. Orlea-Sadovec pottery. 1–8. Krushovitsa (after IVANOV – ZIDAROV – DYAKOV 2014), 9–25. Telish (after MERKYTE 2007)

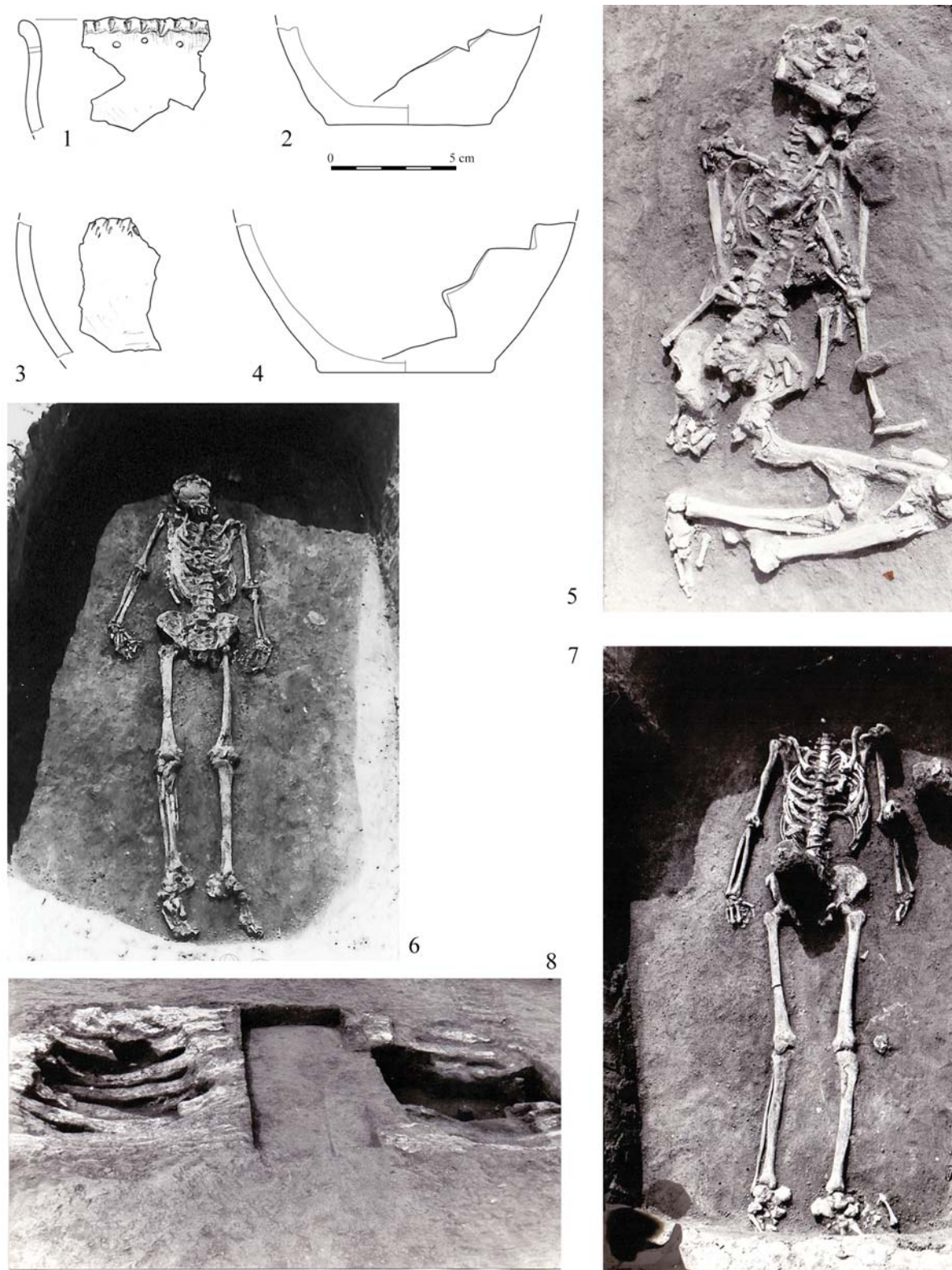


Fig. 14. Goran-Slatina necropolis, barrow III. 1–4. Pottery from the cromlech (drawings S. Alexandrov), 5. Primary grave no. 9, 6–8. secondary extended inhumations – graves nos. 6 and 7 (after KITOV – PANAYOTOV – PAVLOV 1989)

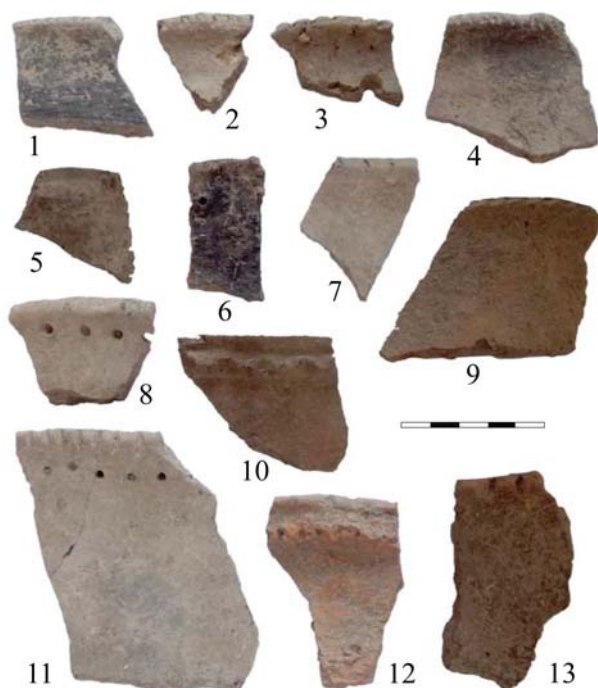


Fig. 15. Dzhulyunitsa - pottery with Orlea-Sadovec characteristics (after ELENSKI 2012)

surrounded by a cromlech with a diameter of 8.6 m (KITOV – PANAYOTOV – PAVLOV 1991, 30–31, 62–74), between the stones of which pottery sherds as the described ones were found (Fig. 14.1–4). Such ceramic sherds appear as far east as Dzhulyunitsa site, Veliko Tarnovo region (Fig. 15). The 3100–2900/2800 BC period in North-West Bulgaria is characterised by Coţofeni II–III manifestations (ALEXANDROV 1995), while the cultural affiliation during that period in Central North Bulgaria still remains unclear.

Mortuary practices in the region are presented by 59 barrow graves⁷ from Polsko Kosovo (STANCHEV 2002), Kozlovets (ALEXANDROV – KIROV – ATANASSOVA 2019), Vladinya,⁸ Goran-Slatina (KITOV – PANAYOTOV – PAVLOV 1991), Tarnava, Kneza, Tarnak (ALEXANDROV 2019) and flat graves (Fig. 1). The latter are presented by cremation graves in the Coţofeni area – Tarnyane necropolis, Vidin region, North-West Bulgaria (VASILEVA – NIKOLAEVA – VASILEVA 2022) and inhumation graves in Central-North Bulgaria. Such graves come from Telish-Lâga (MERKYTE 2005), Ezero-Kaleto (MERKYTE 2007), Vladinya (VALENTINOVA – GUSHTERAKLIEV – IVANOV 2020), Svishtov/Novae (DIMITROV *et al.* 1967, 82, 100; Fig. 9; 32/6), and Dzhulyunitsa (ELENSKI 2010, 33–34, Fig. 1; MATHIESON *et al.* 2018, Supplementary Note 1). The chronological position of the flat graves covers the 3400–2800 cal BC period (Fig. 16). The EBA flat graves in the Lower Danube are *a priori* related to local populations. Considering the above mentioned about their cultural affiliation, their relation to the barrow graves and, especially to the relaxed hocker graves is a problem of a separate analysis.

Most of the barrow graves in Central-North and North-West Bulgaria have been related to “Yamna” populations (PANAYOTOV 1989; KAISER – WINGER 2015). Unfortunately, only three radiocarbon dates from those graves are available (5% of their total number): SUERC-84750: 4380±26 BP for Kozlovets grave (supine position with flexed legs), SUERC-84761: 4169±26 BP for Goran-Slatina, barrow 2,

⁷ The four relaxed hocker graves discussed earlier are included in this number.

⁸ Rescue excavations in 2022 directed by Diana Dimitrova (National Archaeological Institute with Museum – Sofia).

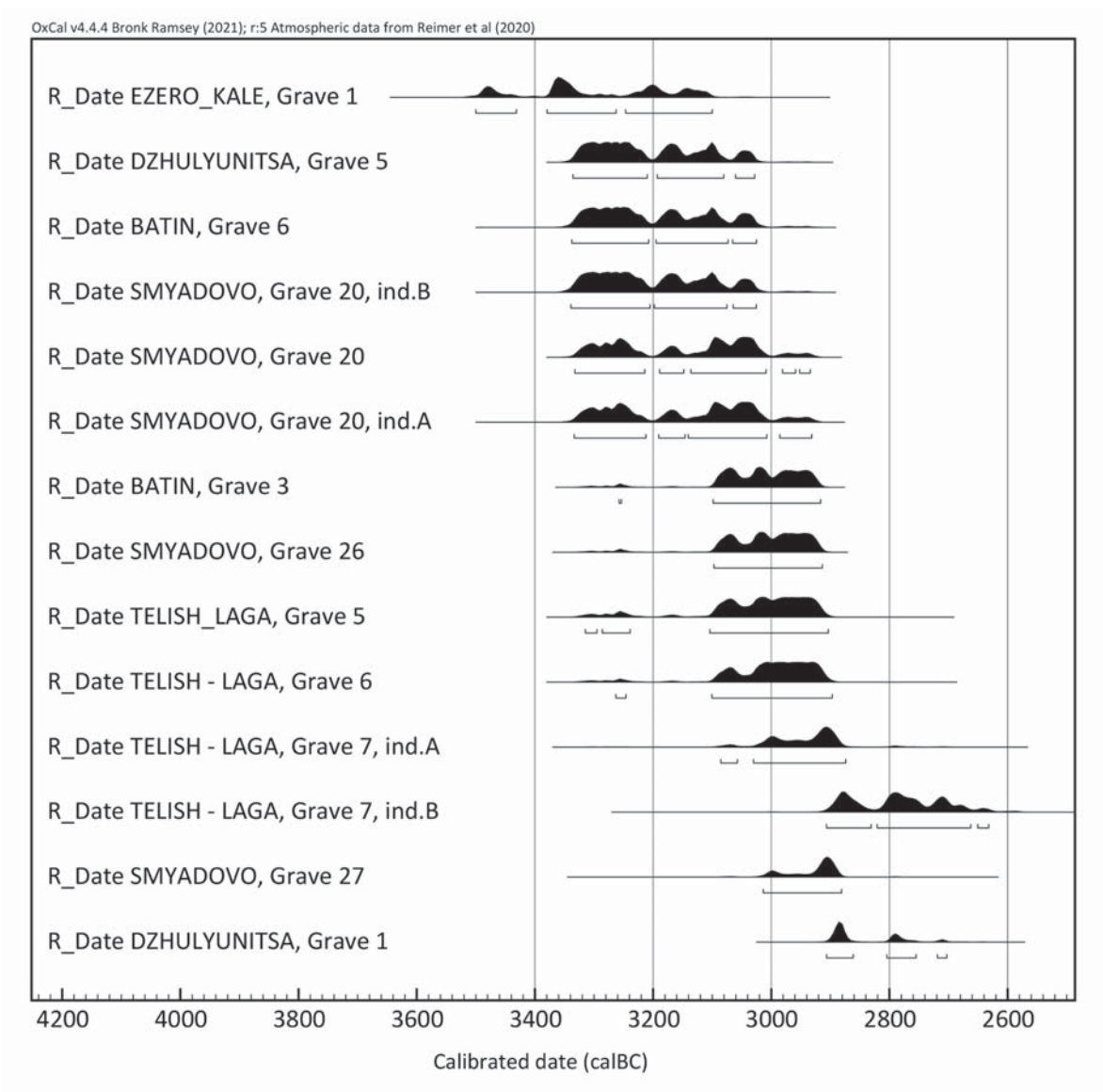


Fig. 16. Early Bronze Age flat graves from North Bulgaria. Calibrated radiocarbon dates

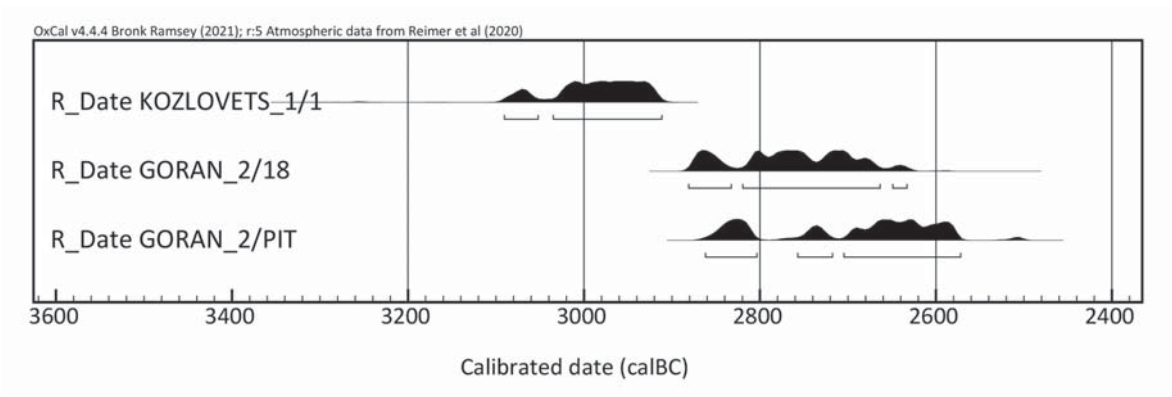


Fig. 17. Calibrated radiocarbon dates from barrow graves in Central-North Bulgaria

grave 18 (semi-supine position) and, SUERC-84762: 4105±26 BP from human bones from “the Pit” from the same barrow (Fig. 17).

Getting back to the topic of this study, the main question to be asked is what is the place of the relaxed hocker barrow graves discussed here in the frame of the EBA development in Northern Balkans and, even in a broader context? The current data allows some preliminary conclusions to be made, such as:

- During the 3400–3100 BC period these graves are not a North-Black Sea phenomenon only. They cover a much larger expanse, with an east-west axis of more than 1000 km in length (Fig. 5). Currently, the concept of “chronological horizon” (MANZURA 2016, 169) for that phenomenon seems acceptable;
- In the Prahova region, in the 3400–3100 BC period, these graves were related to the local populations. In my opinion, for the North-East Bulgaria and North Dobroudja regions, even if there are no undeniable pieces of evidence, a relation to Cernavodă III – Usatovo phenomena could be argued;
- The post-3100 BC relaxed hocker barrow graves in the region discussed are, probably, to be related to local populations. Their nature and affiliation with the “Yamna” graves are yet to be established.

Catalogue of the relaxed hocker graves in North Bulgaria

1. **Kamentsi necropolis, barrow 1, grave 5**, Silistra region (VAGALINSKI 2020). Primary grave. Female, 16–25 years old. Elongated rectangular pit, covered with “...plant sheet/fabric”. Relaxed hocker to the right; right arm in front of the head, left one – in front of the chest. Orientation southwest - northeast, head to the southwest, facing south. No red ochre, no grave inventory. According to the stratigraphic observations, the barrow fill piled above the grave would have been about 25 m in diameter and 1.70 m in height. ¹⁴C date: SUERC-63823: 4401±33 BP (Fig. 2.1; 4.4).
2. **Pet mogili necropolis, barrow 3, grave 4**, Shumen region (ALEXANDROV – KAISER 2016, 365; ALEXANDROV 2021a, fig. 12/5, 6). Primary grave. It was partially destroyed by the later use of the barrow fill during the Roman Age. No anthropological data is available; no pit data. Relaxed hocker to the left; east-west direction with head to the east, facing south; arms bent at the elbows with palms in front of the head; lower limbs are missing. Grave inventory – a clay amphora-like vessel (Fig. 3.3–4).
3. **Vetrino 2 necropolis, barrow 7, grave 1**, Varna region (ALEXANDROV – SLAVCHEV – TONKOVA 2021). Primary grave. Male, 20–30 years old. Rectangular pit with two steps; medium-size stones arranged in one row from east, west and south of the pit; cover on the second pit with tree barks. Relaxed hocker to the right; west-east direction, head to the west, facing south; both arms bent at the elbows, right palm in front of the head, left one – in front of the chest. Red ochre over the ankles, femur, ribs, shoulder, and skull. No grave inventory. ¹⁴C date: SUERC-95544: 4372±23 BP (Figs. 3.2; 4.5).
4. **Belogradets necropolis, barrow 3, grave 2**, Varna region. Primary grave. Adult male and two infants (*Infans I*). The adult individual was placed between the two Infants. No pit data. Relaxed hockers to the right, orientation west-east, heads to the west facing south. Male individual – right arm beneath the head, left arm at the Infant pelvis. No red ochre over the bones. A piece of red ochre was found near the right palm of the male; 16 cm from the male’s skull an animal bone was placed. Five post-holes were discovered at the bottom of the pit - 3 at the eastern part, and 2 – at the western one.⁹ ¹⁴C date: SUERC-87776: 4381±31 BP (Fig. 2.6; 4.3).

⁹ In the article published in 2021 we included in the discussed list of graves Belogradets, Barrow 6, grave 1 (ALEXANDROV – SLAVCHEV – TONKOVA 2021, 11). The description of the grave in the excavation’s journal kept

5. **Pliska-West necropolis, barrow 27, grave 1**, Shumen region (ALEXANDROV 2021a, fig. 12/1). Primary grave. Male, 20–40 years old. Rectangular pit, the bottom faced with an organic cover. Relaxed hocker to the right; west-east direction, head to the west, facing south; right arm in front of the head, left one – in front of the chest. Red ochre over bones; no grave inventory. ¹⁴C date: SUERC-86509: 4455±31 BP (*Fig. 3.1; 4.1*).
6. **Kalugeritsa necropolis, barrow III, grave 4**, Shumen region (MIKOV 1936, 4–5, pl. 1). Primary grave. Buried was a “... young woman”. Rectangular pit; the walls and floor faced with wooden planks; the pit itself covered with wooden planks. A ring of three rows of stones with a total height of circa 0.60 m and diameter of 11 m encircled the grave. Relaxed hocker to the right; orientation east-west, head to east facing north. Both arms are in front of the skull. Red ochre over the upper part of the body. Grave inventory - a silver open ring in the chest area (*Fig. 2.2*).
7. **Madara necropolis, barrow 2, grave 2**, Shumen region (MIKOV 1934, 431). Primary grave? Female. No pit data. Relaxed hocker to the left; orientation west-east, head to west facing north. Both arms are in front of the skull. Red ochre over the bones; pieces of ochre near the skull and arms. No grave inventory.
8. **Madara necropolis, barrow 4, grave 4**, Shumen region (MIKOV 1934, 436). Primary grave? Adult male. No pit data. Relaxed hocker to the right; orientation northeast–southwest, head to northeast facing north. Both arms are in front of the skull. No red ochre. No grave inventory.
9. **Kiulevcha necropolis, barrow I, grave 3**, Shumen region (MIKOV 1936, 8, pl. 4; ALEXANDROV 2011, 311). Primary grave. Infant, 6–7 years old. The oval pit is encircled by a single row of stones with a diameter of 3 m. Relaxed hocker to the right; southwest–northeast direction, head to the west, facing north. Both arms are in front of the skull. Red ochre over the skull and torso; no grave inventory.
10. **Ralitsa, barrow 1, feature 1**, Targovishte region (KARAILIEV – PETROVA 2021). Primary grave. Female, 25–30 years old. Rectangular pit, no signs of covering. Relaxed hocker to the right; west-east direction, head to the west, facing south; both arms are in front of the head. Red ochre at the pelvis area. No grave inventory. ¹⁴C date: SUERC-95546: 4338±22 BP (*Figs. 2.7; 4.6*).
11. **Chudomir, barrow 1, feature 17**, Razgrad region (ALEXANDROV 2021a; 2021b). Primary grave. Female? 55–60 years old. Rectangular pit, flanked with tree-barks. Relaxed hocker to the right; northeast-southwest direction, head to the northeast, facing north; both arms in front of the head. Ochre lumps near the feet. Grave inventory – golden hair-ring beneath the skull; flint scraper in the feet area. Over the grave, a primary barrow fill was piled with a diameter of about 20 m and 1.40 m in height. ¹⁴C date: SUERC-95540: 4446±25 BP (*Fig. 2.3–5; 4.2*).
12. **Goran-Slatina necropolis, Barrow VII, grave 5**, Lovech region (KITOV – PANAYOTOV – PAVLOV 1991, 90–96). Primary grave. Adult individual, no sex determination. Rectangular pit covered with wooden planks; organic cover over the pit-floor. Relaxed hocker to the left; southwest-northeast direction, head to southwest, facing north; left arm – in front of the head, right one – in front of the torso. Red ochre over the skull, ribs, left arm and feet; ochre lumps in the skull area. No grave inventory (*Fig. 6.4–5*).
13. **Tarnak, “Ninovska barrow”, grave no. 2**, Vratsa region (TORBOV 1994). Primary grave. Adult individual, no sex determination. Rectangular pit. Relaxed hocker to the right; west-east direction, head to the west, facing south; both arms in front of the head. Red ochre over the bones, especially the skull. No grave inventory (*Fig. 7.4*).

in NAIM-BAS archive matches most of the above-mentioned criteria but, because of the lack of photos of the feature, it will be excluded from the present discussion.

14. **Tarnava necropolis, “Glavchovska barrow”, Grave no. 1**, Vratsa region (NIKOLOV 1976, 40). Primary grave. Adult male. Rectangular pit covered with wooden planks. Relaxed hocker on the right side. Orientation: west-east. Red ochre over the bones. Grave inventory – clay vessel in front of the skull. Outside the pit, bones from *Bos taurus* were found (Fig. 8.2, 5).
15. **Tarnava necropolis, “Glavchovska barrow”, Grave No. 4**, Vratsa region (NIKOLOV 1976, 41). Secondary grave. Inhumation in a rectangular pit covered with wooden planks. Position of the skeleton¹⁰ – relaxed hocker on the right side. Orientation: south-north. Red ochre over the bones. Grave inventory – clay cup decorated with encrusted incised lines near the skull. The pit had been surrounded by stone walls, 5 m in length (Fig. 8.1, 5).

References

- AILINCĂI, S. C. – MIHAIL, F. – CONSTANTINESCU, M. – CAROZZA, L. – MICU, C. – BURENS, A. 2016
 Découverte d'un tumulus de l'âge du bronze à Rahman, sur la commune de Casimcea (départ. de Tulcea). *Studii și Cercetări de Istorie Veche și Arheologie* 67/1–2 (2016) 29–52.
- ALEXANDROV, S. 1995
 The Early Bronze Age in Western Bulgaria: periodization and cultural definition. In: Bailey, D. – Panayotov, I. (eds.): *Prehistoric Bulgaria*. Monographs in world archaeology, 22, Prehistory press. Madison Wisconsin 1995, 253–271.
- ALEXANDROV, S. 2011
 Prehistoric Barrow Graves between the Danube and the Balkan Range. Stratigraphy and relative chronology. In: Borgna, E. – Müller-Celka, S. (eds.): *Ancestral Landscapes: Burial mounds in the Copper and Bronze Ages (Central and Eastern Europe – Balkans – Adriatic – Aegean, 4th–2nd millennium BC)*. Travaux de la Maison de l'Orient et de la Méditerranée 58. Lyon 2011, 307–320.
- ALEXANDROV, S. 2019
 Early Bronze Age Barrow Graves in North-West Bulgaria. In: Filipović, V. – Bulatović, Al. – Kapuran, Al. (eds.): *Papers in Honour of Rastko Vasić's 80th Birthday*. Belgrade 2019, 75–94.
- ALEXANDROV, S. 2020a
 Bronze Age Barrow Graves in Upper Thrace – Old and new questions. In: Hansen, S. (Hrsg.): *Repräsentationen der Macht, Beiträge des Festkolloquiums zu Ehren des 65. Geburtstags von Blagoje Govedarica*. Wiesbaden 2020, 147–170.
- ALEXANDROV, S. 2020b
 Site 3 near Chudomir, Loznitsa municipality. In: H. Popov (ed.): *Stream Through Time. Rescue archaeological investigations along the expansion of the gas transmission infrastructure of Bulgartransgaz EAD*. National Archaeological Museum Catalogues, Supplementum 1. Sofia 2020, 462–471.
- ALEXANDROV, S. 2021
 Fourth/third millennium BC barrow graves in North-East Bulgaria (120 years of investigations). In: Heyd, V. – Kulcsár, G. – Preda-Bălănică, B. (eds.): *Yamnaya Interactions: Proceedings of the International Workshop held in Helsinki, 25–26 April 2019*. The Yamnaya Impact on Prehistoric Europe, vol. 2. Budapest 2021, 271–314.

¹⁰ The grave was not illustrated. Sex and age were not mentioned as well.

ALEXANDROV, S. 2021b

Rescue excavations of a burial mound near Chudomir village, Loznitsa municipality, Razgrad district. *Arheologicheski otkritiya i razkopki prez 2020*. Sofia 2021, 338–341.

ALEXANDROV, S. – KAISER, E. 2016

The Early Barrow Graves in West Pontic Area. Cultures? Migrations? Interactions? In: Nikolov, V. – Schier, W. (eds.): *Der Schwarzmeerraum vom Neolithikum bis in die Früheisenzeit (6000–600 v. Chr.). Kulturelle interferenzen in der zirkumpontischen Zone und Kontakte mit ihren Nachbargebieten. Prähistorische Archäologie in Südosteuropa* 30. Rahden/Westf. 2016, 359–370.

ALEXANDROV, S. – KIROV, I. – ATANASOVA, N. 2019

Spasitelni arheologicheski razkopki na nadgrobna „Popova“ mogila, s. Kozlovec, obshtina Svishtov. *Arheologicheski otkritiya i razkopki prez 2018 g.* Sofia 2019, 109–110.

ALEXANDROV, S. – SLAVCHEV, V. – TONKOVA, E. 2021

Rescue excavations of Bronze Age barrows in Vetrino region, northeast Bulgaria. *Materiale și Cercetări Arheologice S.N. XVII* (2021) 5–48.

ALEXANDROV, S. – WŁODARCZAK, P. 2022

Chronological sequence of the Early Bronze Age graves in the Pamukli Bair Barrow at Malomirovo and the Pit-Grave Culture expansion in the Middle Tundzha Valley. *Studia Praehistorica* 16 (2022) 153–186.

BOJADZHIEV, Y. 2007

Tell Yunatsite – absolutnaya hronologiya gorizontov epohi rannei bronzi. In: *Tell Yunatsite. Epoha bronzi*. Vol. II, part 1. Moscow 2007, 169–221.

BURTĂNESCU, F. 2002

Epoca timpurie a bronzului între Carpați și Prut cu unele contribuții la problemele epocii bronzului în Moldova. Biblioteca Thracologica XXXVII. București 2002.

CHOHADZHIEV, S. – MIHAYLOVA, N. 2014

Smyadovo. Prehistoric cemetery 2005–2008. Sofia 2014.

CIUGUDEAN, H. – QUINN, C. – UHNÉR, C. 2022

Considerații privind evoluția culturii Coțofeni în lumina noilor date radiocarbon. *Apulum LIX series Archaeologica et Anthropologica* (2022) 23–54.

DANI, J. 2020

Kurgans and their builders. The Great Hungarian Plain at the dawn of the Bronze Age. *Hungarian Archaeology* 9 (2020) 1–20.

DANI, J. – NEPPER, I. M. 2006

Sárrétudvari- Órhalom Tumulus Grave from the Beginning of the Early Bronze Age in eastern Hungary. *Communicationes Archaeologicae Hungariae* (2006) 29–63.

DEMCHENKO, T. 2016

K voprosu o vaidelenii kulturnoi grupoi Bursuceni v ramkah Gordineshtsko – Pozdnemajkopskogo fenomena. In: Sîrbu, L. – Telnov, G. N. – Ciobanu, L. – Sîrbu, G. – Kaşuba, M. (eds.): *Culturi, procese și contexte în arheologie. Volum omagial Oleg Levițki la 60 de ani*. Chișinău 2016, 84–99.

DIACHENKO, A. – HARPER, T. K. 2016

The absolute chronology of Late Tripolye sites: a regional approach. *Sprawozdania Archeologiczne* 68 (2016) 81–105.

DIACONESCU, D. 2020

Step by steppe: Yamnaya culture in Transylvania. *Praehistorische Zeitschrift* 95/1 (2020) 17–44.

DIMITROV, D. P. – CHICHIKOVA, M. – DIMITROVA, A. – NAJDENOVA, V. 1967

Arheologicheskie raskopki v vostochnom sektore Nove v 1965 godu. *Izvestiia na arheologicheskiia institut XXX* (1967) 75–100.

DRAGANOV, V. 1990

Kulturata Cernavodă III na teritoriyata na Balgaria i po zapadnoto cernomorsko krajbrezie. *Dobrudza* 7 (1990) 156–179.

ELENSKI, N. 2010

Sondazni prouchvaniya na rannoneolitnoto selishte Dzhulyunica – Smardesh. *Arheologicheski otkritiya i razkopki prez 2009*. Sofia 2012, 33–35.

ELENSKI, N. 2012

Sondazni prouchvaniya na rannoneolitnoto selishte Dzhulyunica – Smardesh. *Arheologicheski otkritiya i razkopki prez 2011*. Sofia 2012, 40–42.

FRÎNCULEASA, A. 2020a

Earthen burial mounds and the Coțofeni Culture south of the Carpathians: The archaeological research in Ariceștii-Rahtivani – Movila pe Răzoare. *Ziridava* 34 (2020) 35–89.

FRÎNCULEASA, A. 2020b

Cultura Cernavodă II la Dunărea Inferioară. Relevanța cronologiei și a înmormântărilor tumulare. *Studii de Preistorie* 17 (2020) 135–193.

FRÎNCULEASA, A. 2021

Burial mounds in the Lower Danube region – From the international to the local and the other way round. In: Heyd, V. – Kulcsár, G. – Preda-Bălănică, B. (eds.): *Yamnaya Interactions: Proceedings of the International Workshop held in Helsinki, 25–26 April 2019*. The Yamnaya Impact on Prehistoric Europe, vol. 2. Budapest 2021, 173–205.

FRÎNCULEASA, A. – PREDA, B. – HEYD, V. 2015

Pit-graves, Yamnaya and kurgans along the Lower Danube: Disentangling 4th and 3rd millennium BC burial customs, equipment and chronology. *Praehistorische Zeitschrift* 90/1–2 (2015) 45–113.

GLESER, R. 2011

Radiokarbondaten aus Drama: Stand der Forschungen bis zum Jahre 2010. *Studia Praehistorica* 14 (2011) 177–204.

HEYD, V. 2011

Yamnaya group and tumuli west of the Black Sea. In: Borgna, E. – Müller-Celka, S. (eds.): *Ancestral Landscapes. Burial Mounds in the Copper and Bronze Ages (Central and Eastern Europe – Balkans – Adriatic – Aegean, 4th–2nd Millenium B.C.)*. Travaux de la Maison de l’Orient et de la Méditerranée 58. Lyon 2011, 535–555.

IVANOV, G. – ZIDAROV, P. – DYAKOV, M. 2014

Obekt ot bronzovata epoha v m. Popska mogila, obshtina Dolni Dybnik. *Arheologicheski otkritiya i razkopki prez 2013*. Sofia 2014, 106–108.

ILIEV, I. K. – BAKÁRDŽIEV, S. 2020

Kurgane der Frühen bis Späten Bronzezeit im Bezirk Jambol. Südostbulgarien. Echt, R. – Heyd, V. – Preda-Bălănică, B. (Hrsg.): *The Yamnaya Impact on Prehistoric Europe*, Vol. 1. Budapest 2020.

KAISER, E. – WINGER, K. 2015

Pit graves in Bulgaria and the Yamnaya Culture. *Praehistorische Zeitschrift* 90/1–2 (2015) 114–140.

KARAILIEV, P. – PETROVA, R. 2021

Rescue archaeological excavations of a site near the village of Ralitsa, Targovishte municipality. *Arheologicheski otkritiya i razkopki prez 2020*. Sofia 2021, 328–330.

KITOV, G. – PANAYOTOV, I. – PAVLOV, P. 1991

Mogilni nekropoli v Lovetshkia krai. Ranna bronzova epoha. Nekropolat Goran-Slatina (Razkopki i Pruchvania 23). Sofia 1991.

MANZURA, I. 1999

The Cernavodă I Culture. In: Nikolova, L. (ed.): *The Balkans in Later Prehistory: Periodization, Chronology and Cultural Development in the Final Copper and Early Bronze Age (Fourth and Third Millennia BC)*. BAR International Series 791. Oxford 1999, 95–174.

MANZURA, I. 2016

North-Pontic steppes at the end of the 4th millennium BC: The epoch of broken borders. In: Zanoci, A. – Kaiser, E. – Kashuba, M. – Izbitser, E. – Băţ, M. (eds.): *Man, Culture and Society from the Copper Age until the Early Iron Age in Northern Eurasia. Contributions in honor of the 60th anniversary of Eugen Sava*. Chişinău 2016, 53–75.

MANZURA, I. 2020

History carved by the dagger: The society of the Usatovo Culture in the 4th millennium BC. In: Hansen, S. (ed.): *Repräsentationen der Macht. Beiträge des Festkolloquiums zu Ehren des 65. Geburtstags von Blagoje Govedarica*. Kolloquien zur Vor- und Frühgeschichte 25. Wiesbaden 2020, 73–96.

MATHIESON, I. – ALPASLAN-ROODENBERG, S. – POSTH, C. – SZÉCSÉNYI-NAGY, A. – ROHLAND, N. – MALLICK, S. et al. 2018

The genomic history of Southeastern Europe. *Nature* 555//7695 (2018) 197–203.

MERKYTE, I. 2005

Lîga. Copper Age Strategies in Bulgaria. Acta Archaeologica 76/1, Acta Archaeologica Supplementa VI. Blackwell Munksgaard 2005.

MERKYTE, I. 2007

Ezeri - Kale from the Copper Age to the Bronze Age in the Southern Balkans. *Acta Archaeologica* 78/2 (2007) 1–78.

MISHINA, T. – BALABINA, V. 2007

Pogrebeniya: opisaniye i analiz. In: *Tell Yunatsite. Epoha bronzi*. Vol. II, part 1. Moscow 2007, 169–207.

MIKOV, V. 1934

Posledni mogilni nahodki. *Madara* 1 (1934) 429–438.

MIKOV, V. 1936

Stari mogilni grobove pri Kalugeritsa i Kiulevcha. *Madara* 2 (1936) 3–10.

MOTZOI-CHICIDEANU, I. 2011

Obiceiuri funerare în epoca bronzului la Dunărea mijlocie şi inferioară, vol. I-II. Bucureşti 2011.

NIKOLOV, B. 1976

Mogilni pogrebeniya ot rannobronzovata epoha do Tarnava i Knezha, Vrachanski okrag. *Arheologia* 3 (1976) 38–51.

NIKOLOVA, L. 1999

The Balkans in Later Prehistory. Periodization, Chronology and Cultural Development in the Final Copper and Early Bronze Age (Fourth and Third Millennia BC). BAR International Series 791. Oxford 1999.

OANȚĂ-MARGHITU, S. 2003

„Fenomenul Cernavodă III-Boleráz”: după 30 de ani. *Cercetări Arheologice* 12 (2003) 109–138.

PANAYOTOV, I. 1989

Yamnata kultura v balgarskite zemi. Razkopki i Prouchvania 21. Sofia 1989.

POPOVICI, S. 2020

Ecouri nord-vest caucaziene în complexele tumulare timpurii din nord-vestul Mării Negre. In: Melniciuc, A. – Niculică, B. P. – Ignătescu, S. – Enea, S.-C. (eds.): *Eternitatea arheologiei, Studii în onoarea profesorului Dumitru Boghian la a 65-a aniversare*. Cluj-Napoca 2020, 519–537.

POPOVICI, S. – CIOBANU, I. – AGULNICOV, S. – NOROC, I. 2015

Tumulul 8 de la Cimișlia. Considerații preliminare. *Arheologia preventivă în Republica Moldova* III (2015) 19–28.

POPOVICI, S. – KAISER, E. 2020

Burial Mound in the Town of Cimișlia in Southern Part of the Republic of Moldova: Relative and Absolute Chronology of the Burials. In: Burova, N. D. – Vybornov, A. A. – Kulkova, M. A. (eds.): *Radiouglerod v arkheologii i paleoekologii: proshloe, nastoyashchee, budushchee. Materialy mezhdunarodnoy konferentsii, posvyashchennoy 80-letiyu starshego nauchnogo sotrudnika IIMK RAN, kandidata khimicheskikh nauk Ganny Ivanovny Zaytsevov*. Sankt-Petersburg 2020, 71–74.

PREDA-BĂLĂNICĂ, B. – FRÎNCULEASA, A. – HEYD, V. 2020

The Yamnaya impact north of the Lower Danube: A tale of newcomers and locals. *Bulletin de la Société préhistorique française* 117/1 (2020) 85–101.

PRIVAT, K. – SOBOTKOVA, A. – BAKARDZHIEV, S. – RUSSEVA, V. 2018

Excavation and Palaeodietary Analysis of Bronze-Age Human Remains from Boyanovo, Yambol Province. In: Sobotkova, A. – Tzvetkova, J. – Nehrizov, G. – Ross, S. – Connor, S. (eds.): *The Tundzha Regional Archaeological Project: Surface Survey, Palaeoecology, and Associated Studies in Central and Southeast Bulgaria, 2009-2015 Final Report*. Oxbow Books 2018.

RASSAMAKIN, J. J. 2004

Die nordpontische Steppe in der Kupferzeit. Gräber aus der Mitte des 5. Jts. bis Ende des 4. Jts. v. Chr. Archäologie in Eurasien 17. Mainz am Rhein 2004.

RASSAMAKIN, Y. 2021

Between the Don and the Danube: The Phenomenon of the Zhivotilovka-Volchanskoe Type of Burials at the Turn of the Late Eneolithic and the Early Bronze Age in the Northern Black Sea Steppe. In: Giemsch, L. – Hansen, S. (eds.): *The Caucasus. Bridge between the urban centers in Mesopotamia and the Pontic steppes in the 4th and 3rd millennium BC. The transfer of knowledge and technologies between East and West in the Bronze Age*. Regensburg 2021, 195–210.

ROMAN, P. 1976

Complexul Orlea – Sadovec. *Studii și Cercetări de Istorie Veche și Arheologie* 27/2 (1976) 157–170.

ROMAN, P. – DODD-OPRIȚESCU, A. – JÁNOS, P. 1992

Beiträge zur Problematik der schnurverzierten Keramik Südosteuropa. Mainz am Rhein 1992.

SCHUSTER, C. – MORINTZ, A. – KOGĂLNICEANU, R. – ȘTEFAN, C. – COMȘA, A. – EL-SUSI, G. et al. 2011

Cercetările arheologice de pe tronsonul Cernavodă-Medgidia al autostrăzii A2. Tumulul nr. 3. Târgoviște 2011.

SIMION, G. 2003

Migrația popoarelor indo-europene la Dunărea de Jos. In: Simion, G. (ed.): *Culturi antice în zona gurilor Dunării*. Vol. I: *Preistorie și protoistorie*. Biblioteca Istro-Pontica, Serie Arheologie 5. Constanța 2003, 13–50.

STANCHEV, D. 1989

Nekropol ot bronzovata epoha do selo Batin, Rusensko. *Godishnik na muzeite v Severna Balgaria* 15 (1989) 7–13.

STANCHEV, D. 2002

Rezultati ot arheologicheskite razkopki na mogilata Yalandzi tepe do s. Polsko Kosovo, Rusensko. *Илѹн* (2002) 519–531.

TODOROVA, H. 2011

Dobrudza prez praistoricheskata epoha. In: Todorova, H. – Jordanov, K. – Velkov, V. – Torbatov, S. (eds.): *Istoriya na Dobrudza, Vol. 1*. Veliko Tarnovo 2011, 31–130.

TORBOV, N. 1994

Rezultati ot arheologicheskoto prouchvane na Ninovskata mogila pri Tarnak, Beloslatinsko. *Izvestiya na muzeite v severozapadna Balgaria* 22 (1994) 11–21.

VAGALINSKI, L. 2020

Early Bronze Age tumulus near the village of Kamentsi, Silistra region, NE Bulgaria. *Archaica* 7–8 (2019–2020) [2020] 19–27.

VALENTINOVA, M. – GUSHTERAKLIEV, R. – IVANOV, G. 2020

Site A6/4002 near Vladinya, Lovech Municipality. In: Popov, H. (ed.): *Stream through time. Rescue archaeological investigations along the expansion of the gas transmission infrastructure of Bulgartransgaz EAD*. National Archaeological Museum. Catalogues, Supplementum 1. Sofia 2020, 229–241.

VASILIU, I. 2004

Date noi privind epoca bronzului în nordul Dobrogei. Mormintele cu ocră de la Enisala-La Bălțiță. *Ialomița* IV (2003–2004) 124–136.

VASILEVA, E. – NIKOLAEVA, E. – VASILEVA, Z. 2022

Obekt № 7 po traseto na pat I-1 (E-79) Vidin – Ruzinci – Montana, s. Tarnyane, obl. Vidin. *Arheologicheski otkritiya i razkopki prez 2021*. Sofia 2022, in print.

ZMEYKOVA, I. 2001

The Cernavodă III culture in North-Eastern Bulgaria. In: Roman, P. – Diamandi, S. (eds.): *Cernavodă III – Boleráz. Ein vorgeschichtliches Phänomen zwischen dem Oberrhein und der unteren Donau. Symposium Mangalia/Neptun (18.–24. Oktober 1999)*. Studia Danubiana, Series Symposia II. București 2001, 213–235.

Tracing the root of cord decoration on Early Bronze Age pottery in Upper Thrace

MASAO SEMMOTO

Abstract

For many years, researchers have discussed that pottery with cord decoration excavated from the Early Bronze Age sites of Upper Thrace in southern Bulgaria appeared alongside the expansion of the Yamnaya culture that developed in the steppe of the North and West Black Sea. Highlighting the importance of a comparative analysis of the cord-decoration technique to demonstrate the cultural root of cord-decorated pottery makers in Upper Thrace, this study examines the chronological order and typological characteristics of the initial cord decoration on pottery in Upper Thrace in the Early Bronze Age. The results reveal that small shallow bowls with fine S-twisted cord decoration emerged around 3000 cal BC in Upper Thrace. I compared the initial cord-decorated pottery in Upper Thrace with that from the archaeological entities in the Dniester–Prut interfluvium and the Lower Danube valley (Cernavoda II, Coțofeni, Horodiște-Gordinești, Usatovo, and Yamnaya) together with their relative dates and ^{14}C data. The analysis proves that the cord-decorated pottery of Upper Thrace did not derive from the Yamnaya culture. Instead of the Yamnaya or other cultures, this study presents a plausible alternative that the Horodiște-Gordinești group moved with the cord decoration technique, not with the products, to Upper Thrace. The Horodiște-Gordinești group did not leave much archaeological evidence, but there are marine shell products that imply interaction with the local groups in Upper Thrace. This result entails the need for further research precisely dating archaeological events related to cord-decorated pottery and considering the other archaeological materials to elucidate the migration of the Horodiște-Gordinești group.

Key words: Cord decoration on pottery, decoration technique, Early Bronze Age, Bulgaria, Upper Thrace

Introduction

The migration of populations and the spread of innovative technology led to significant social and cultural changes that occurred in wider areas of Europe between the 4th and 3rd millennia BC. In particular, the migration of the Yamnaya population originating from the north of the Black Sea played a pivotal role. This issue related to the origin and expansion of the Indo-European group in West Eurasia has long been debated since the 1970s (e.g., GIMBUTAS 1970; 1977; MALLORY 1989; ANTHONY 2007; KRISTIANSEN *et al.* 2017). Recently, remarkable aDNA studies confirmed Yamnaya migration from the northern Black Sea grassland to the Corded Ware culture in central Europe (ALLENTOFT *et al.* 2015; HAAK *et al.* 2015), which spurred arguments on prehistoric migrations across Europe. In response to these articles by archaeogeneticists, some scholars have discussed that multidirectional, not unidirectional or single-event, interactions among archaeological entities including the Yamnaya in eastern and central Europe increasingly arose in the late 4th and the 3rd millennia BC (HEYD 2017; FURHOLT 2021).

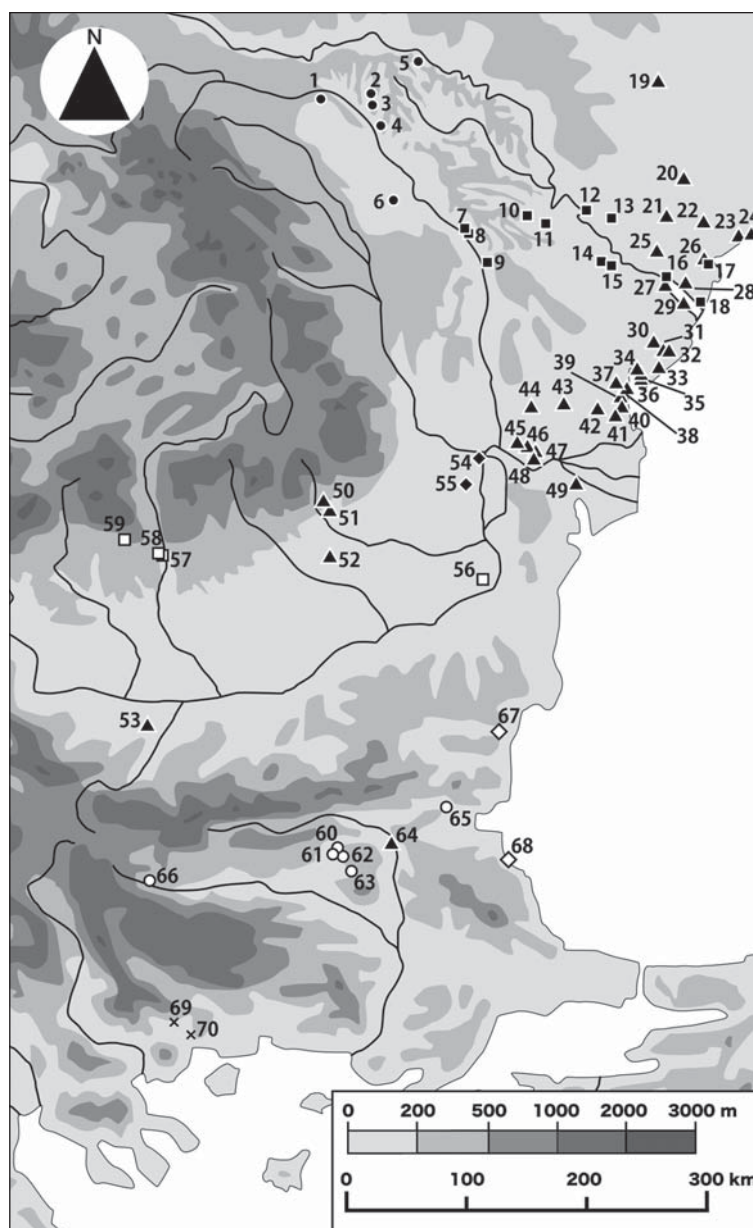


Fig. 1. Map of southeastern Europe showing the locations of sites analysed in the study.

● Horodiște-Gordinești group ■ Usatovo group ▲ Yamnaya culture ◆ Cernavoda II culture □ Coțofeni culture
○ EBA Upper Thracian culture ◇ Ezerovo II group × EBA Northern Greek culture

1. Horodiște-Dealul Mălăiește, 2. Trinca-Izvoarul lui Luca, 3. Gordinești II-Stîncă goală, 4. Hancăuți I-La Frasin, 5. Mereșeuca I-Cetățuie, 6. Erbiceni-Dealul Sărăturii, 7. Dancu I, 8. Dancu II, 9. Sărata Răzeși, 10. Dănceni I&II, 11. Mereni, 12. Speia, 13. Ternovka, 14. Răscăeți, 15. Purcari, 16. Mayaki, 17. Usatovo, 18. Alexandrovka, 19. Grigor'evka, 20. Baranovo, "Soldatskaya slava", 21. Kholmское, 22. Holodnaya Balka, 23. Vapnyarka, 24. Sychavka, 25. Yasski, 26. Novaya Dolina II, 27. Semenovka, 28. Efimovka, 29. Mologa, 30. Sergeevka, 31. Diviziya II, 32. Alkaliya, 33. Zheltiy Yar, 34. Novoselitsa, 35. Trapovka II, 36. Vishnevoe, 37. Bashtanovka, 38. Glubokoe, 39. Strumok, 40. Neruşaj, 41. Mirnoe, 42. Chervonyi Yar I, 43. Novokamenka, 44. Kurci, 45. Frikatsey, 46. Nagornoe, 47. Plavni, 48. Gradeshka, 49. Independența, 50. Gurbănești, 51. Ploiești-Triaj, 52. Blejoi, 53. Tarnava, 54. Brăilița, 55. Lișcoteanca-Movila Olarului, 56. Grădiște-Coslogeni, 57. Ocnița-Cosota, 58. Ocnele Mari Aval Baraj, 59. Milostea, 60. Ezero-Dipsizka mogila, 61. Dyadovo, 62. Sokol Himitliyata, 63. Ovcharitsa II, 64. Drazhevo-Sabev bair, 65. Karnobat, 66. Yunatsite, 67. Ezerovo II, 68. Kiten-Urdoviza, 69. Sitagroi, 70. Dikili Tash

Based on the evidence of ritual events in the funerary mounds (Kurgans), most researchers agree that the Yamnaya groups moved from northwest of the Black Sea to Upper Thrace (southern Bulgaria), Serbia, and Hungary (GIMBUTAS 1979, 127–128; ANTHONY 2007, 361–362; HARRISON – HEYD 2007, 194; KAISER – WINGER 2015). The Yamnaya tumuli, located in the western Black Sea, are generally dated from the end of the 4th millennium BC to the middle 3rd millennium BC (RASSAMAKIN – NIKOLOVA 2008, 65; IVANOVA 2013a, 219; KAISER – WINGER 2015, 127–128; DIACONESCU 2020, 25–26). The Yamnaya materials bore diverse characteristics in each region, retaining the common funerary tradition. Moreover, the Yamnaya culture in the Bulgarian region in the Early Bronze Age (EBA) was once designated as the Lower Danube variant (PANAJOTOV 1989). Recently, this variant has been subdivided into two distinct groups between the northern and southern Bulgarian lands because of the grave inventory (ALEXANDROV – KAISER 2016, 367); thus, Upper Thrace occupies the southernmost part of the Yamnaya tumuli distribution areas known so far (*Fig. 1*).

The Yamnaya group is thought to have brought a variety of novel cultural elements into southeastern Europe as the Yamnaya package (HARRISON – HEYD 2007, 196–197, *Fig. 45*), three elements of which were highlighted: mound, anthropomorphic stelae, and cord decoration on pottery (HEYD 2011, 546). Although the burial mounds existed prior to the emergence of the Yamnaya groups in the Bulgarian region (ALEXANDROV 2011, 315–316; ALEXANDROV – KAISER 2016, 365–366), the first two elements have been recognized as distinctive characteristics of the Yamnaya culture. In contrast, the last one has not drawn much attention in the context of the funerary complex. One of the main reasons is that pottery with cord decoration has rarely been found in the mound graves of Upper Thrace. However, this type of pottery has been considered to appear under the direct influence of the Yamnaya migrations (TELEGIN 1992, 337; HARRISON – HEYD 2007). On the other hand, some scholars argued that the technical skill of the cord decoration was transferred to the local population in Upper Thrace through contact with the Yamnaya (KATINCHAROV 1974, 15–17; GEORGIEV *et al.* 1979, 503; LICHARDUS – LICHARDUS 1995, 51; ANTHONY 2007, 365; IVANOVA 2014, 15). Moreover, others emphasise that one of the production centres was established after the introduction of the cord decoration, since some of the pottery was excavated from the EBA tell settlement (Dipsizka mogila) at Ezero (NIKOLOVA 1994, 68; LESHTAKOV – TSIRTSONI 2016, 480).

Despite wide acceptance of existing explanations that the cord decoration was originally alien to the inhabitants of Upper Thrace, whether the cord-decorated pottery unearthed from the settlements was derived from the Yamnaya culture still warrants discussion. The excavators at Ezero indicated that the forms and decorative patterns of the EBA cord-decorated pottery prevalent in Upper Thrace were inherent to the local ceramic assemblage (GEORGIEV *et al.* 1979, 503). Furthermore, Petre Roman suggested that cord-decorated vessels were produced by the local Ezero groups following their own ceramic style (ROMAN – DODD-OPRIȚESCU – JÁNOS 1992, 89–90). While there are repetitive arguments on the local pottery style and the allusions to the presence of the cord decoration on pottery, what seems to be required for a new approach to the cultural root is a comparative analysis of the cord-decoration technique.

To summarise, I aim to demonstrate that the cord decoration technique is effective in examining the transfer process of the cord decoration on EBA pottery in Upper Thrace and to elucidate the typological and technical characteristics of the earliest cord-decorated pottery. Examination of the stratigraphic relationship and the ¹⁴C dates reveals the date of occurrence of cord-decorated pottery in Upper Thrace. By comparing the initial cord-decorated pottery from the settlements and burials in Upper Thrace with that of the Lower Danube and the Dniester–Prut valleys, this study provides evidence about when, from where, and how cord decoration on EBA pottery was brought to Upper Thrace, and proposes an alternative hypothesis to the Yamnaya-culture origin.

Cord decoration on pottery as a cultural element

Cord decoration on prehistoric pottery is an important cultural element in typo-chronological studies in southeastern Europe. The decoration is made by impressing the cord when the vessel surface is wet. Cords are prepared from plant or animal fibers and are twisted by hand or using a spindle whorl. According to ancient textile research, how to make cords depends on the cultural background to which the agents belong (ANDERSSON STRAND 2012, 31–33). Cord making is a cultural behavior, as is pottery making, so technical data of the cordage extracted from the cord impression on pottery enable us to understand the tradition of cord-decorated pottery makers. Hurley and Grömer listed analytical components to characterise cord-decorated pottery pertaining to technical skill (HURLEY 1979, 5–7; GRÖMER – KERN 2010, 3137). Based on their lists, I focus on three attributes: cord type, twist direction, and width of impression. They have been regarded as useful to examine cultural affiliations of the makers and to understand tempo-spatial variability (BARBER 1991, 65–78; GIBSON – WOODS 1997, 130–134; WŁODARCZAK 2006, 83–84; WILD 2008, 470; ANDERSSON STRAND 2012, 33). Hence, analysing the technical attributes of cord decoration can provide an opportunity to reveal the transfer process in Upper Thrace.

In the study of prehistoric pottery in southeastern Europe, two types of cord decoration are usually mentioned: true and false cords (Wickelschnur) (ROMAN – DODD-OPRIȚESCU – JÁNOS 1992, 31). Since the description “false cord” does not reflect the actual feature (MEYER 2008, 112), I consider the former as twisted cord and the latter as wrapped cord. The twist direction of the impression is a reversed image of the original twisted cord (*Fig. 2*). Hence, I use S and Z to designate the direction of the cord impression on pottery to avoid confusion. Although the direction of the wrapped cord can also be determined as a twisted cord, this study does not consider it in detail to facilitate the discussion.

One of the oldest examples of cord-decorated pottery in the steppes north of the Black Sea appeared in the second phase of the Sredny Stog culture in the second half of the 5th millennium BC (KOTOVA 2010, 105; REINGRUBER – RASSAMAKIN 2016, 302–303). According to ROMAN’s monograph (1992), contemporaneously or slightly later, the cord decoration was introduced at the Cucuteni AB stage in the eastern part of the Carpathian Mountains and in the Cernavoda I culture in the Lower Danube valley.

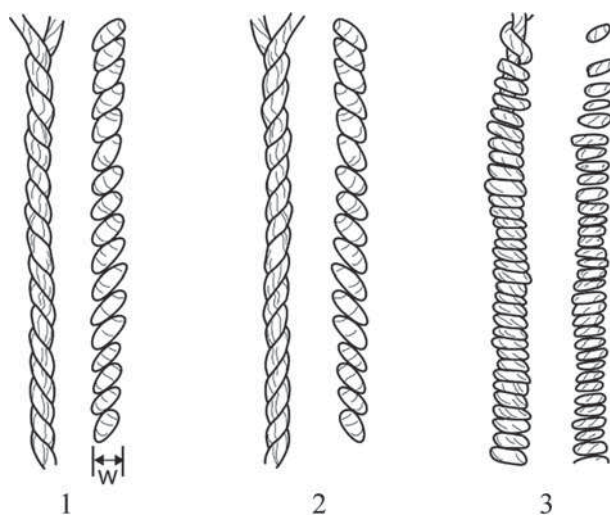


Fig. 2. Cord types and their imprints of S-twisted, Z-twisted, and Wrapped cord. 1-left: S-twisted cord, right: S-twisted cord imprint, 2-left: Z-twisted cord, right: Z-twisted cord imprint, 3- left: Wrapped cord, right: Z- Wrapped cord imprint. “w” indicates width of the imprint

In Upper Thrace, pottery with cord decoration appeared around the beginning of the EBA and was sustained up to the middle of the 3rd millennium BC. This study focuses on the earliest EBA sources to prevent the characteristics of the entire duration spanning more than 500 years from being treated as one unified ceramic type and, thus, misunderstanding the initial characteristics specific to the time of the introduction.

Early Bronze Age pottery with cord decoration in Upper Thrace

Almost all the pottery with cord decoration in Upper Thrace has been unearthed from settlement sites; only two vessels were recovered from burials. The thick cultural layers of the settlement mounds at Ezero and Dyadovo help reveal the chronological order and typological characteristics of the earliest pottery with cord decoration in the region. At these sites, each EBA cultural layer was divided into 13 and 20 building levels, respectively. *Table 1* shows the correspondence between the building levels of Ezero and Dyadovo and each stage using pottery sequences and ¹⁴C dates of 40–50 samples (GÖRSDORF – BOJADŽIEV 1996; SEMMOTO 2021).

Table 1. Chronological chart of the Early Bronze Age in Upper Thrace showing each stage, its calibrated dates, and building levels sampled from Ezero and Dyadovo

Period	cal BC	stage	building level	
			Ezero	Dyadovo
EBA 1	3200–2900	Ezero	13–9 (Ezero A1, A2)	20–9
EBA 2	2900–2500	Mihalich	8–4 (Ezero AB, B1)	8–5
EBA 3	2500–2200	Sv. Kirilovo	3–1 (Ezero B2)	4–1

According to the excavators, pottery with cord decoration appears in Ezero 11–9 and Dyadovo 14–9. No cord decoration has been observed below these building levels, other than one anomaly from the 13th building level at Ezero (GEORGIEV *et al.* 1979, Tab. 198). The modelled dates from Dyadovo assign the emergence of cord decoration to approximately 3000 cal BC (*Fig. 3*). The start date of Ezero 11 is within the same time span (WENINGER 1995, Fig. 8; SCHWENZER 2005, 186). Therefore, the ¹⁴C dates allow the division of the EBA 1 in Upper Thrace into two phases by the presence or absence of cord decoration on pottery, namely EBA 1a (3200–3000 cal BC: Ezero A1) and EBA 1b (3000–2900 cal BC: Ezero A2) (*Table 1*).

Twenty-three vessels and fragments with cord decoration at Ezero, Dyadovo, and Sokol Himitliyata belong to the EBA 1b. The usual form of the cord-decorated pottery is a small shallow bowl with a slightly convex wall and sometimes with a thickened or slightly out-curved rim (*Fig. 4*). It is covered with rhombic lattice or diagonal-filled geometric patterns on both sides of the vessel's surface. It is worth noting that the S-twisted cord (n = 20, 87%) was more prevalent than the Z-twisted one (n = 3, 13%). Furthermore, the width of the S-twisted cords ranges from 1.0 mm to 2.7 mm and 85% of them fall in the fine category ranging between 1.0 mm and 2.0 mm. Thus, the small shallow bowls with complex patterns using thin S-twisted cords were characteristic of the EBA 1b (*Table 2*).

Parallels have been found in other EBA settlements at Ovcharitsa II and Karnobat and from Yamnaya burials at Drazhevo-Sabev bair (*Fig. 5*). Although they cannot be precisely dated to the EBA 1b, as there are no ¹⁴C dates published, typologically their dates can be assigned to the EBA 1b or early EBA 2

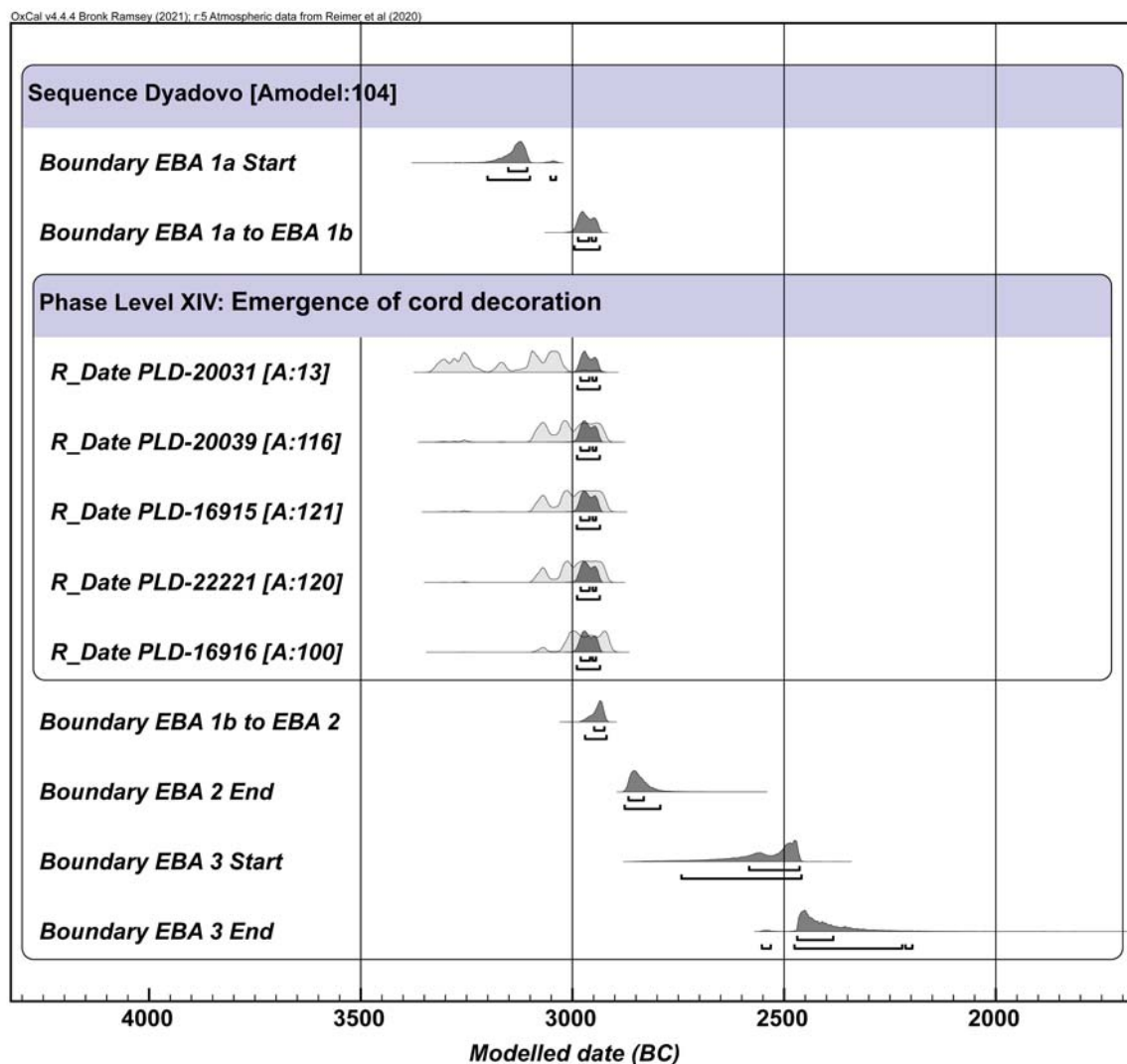


Fig. 3. Modeled calibrated dates of EBA samples from Dyadovo. EBA 1b begins with the 14th building level. The modelled dates were made by OxCal v.4.4

(LESHTAKOV – KANCHEVA-RUSSEVA – STOYANOV 2001, 20–21; BOYADZHIEV – BOYADZHIEV 2016, 152; ILIEV – BAKĀRDŽIEV 2020, 31–33). This means that it does not date back to before 3000 cal BC. Their spatial distribution is concentrated in northeastern Upper Thrace and they have not been found anywhere else in the plain. Later, in the EBA 2 and early EBA 3, they were replaced by shallow bowls with incurving rims and pots with simpler patterns of coarse Z-twisted cords. Finally, in the late EBA 3, the cord decoration on pottery faded away.

There is little pottery with cord decoration in western Upper Thrace (NIKOLOVA 1996, 176). Pottery fragments with cord decoration, belonging to the EBA 2 and EBA 3, were unearthed from building levels 15–4 in Yunatsite (MISHINA 2011, 70, 75). The ¹⁴C and archaeomagnetic dates indicate that the lowest building level 17 began later than 3000 cal BC (KOSTADINOVA-AVRAMOVA – KOVACHEVA – BOYADZHIEV 2014, Tab. 1; BOYADZHIEV – ASLANIS 2016, 163). Of the 12 fragments I observed, 11 were Z-twisted. A similar trend of the twist direction is observed at Sitagroi Va and Dikili Tash IIIB in northern Greece,

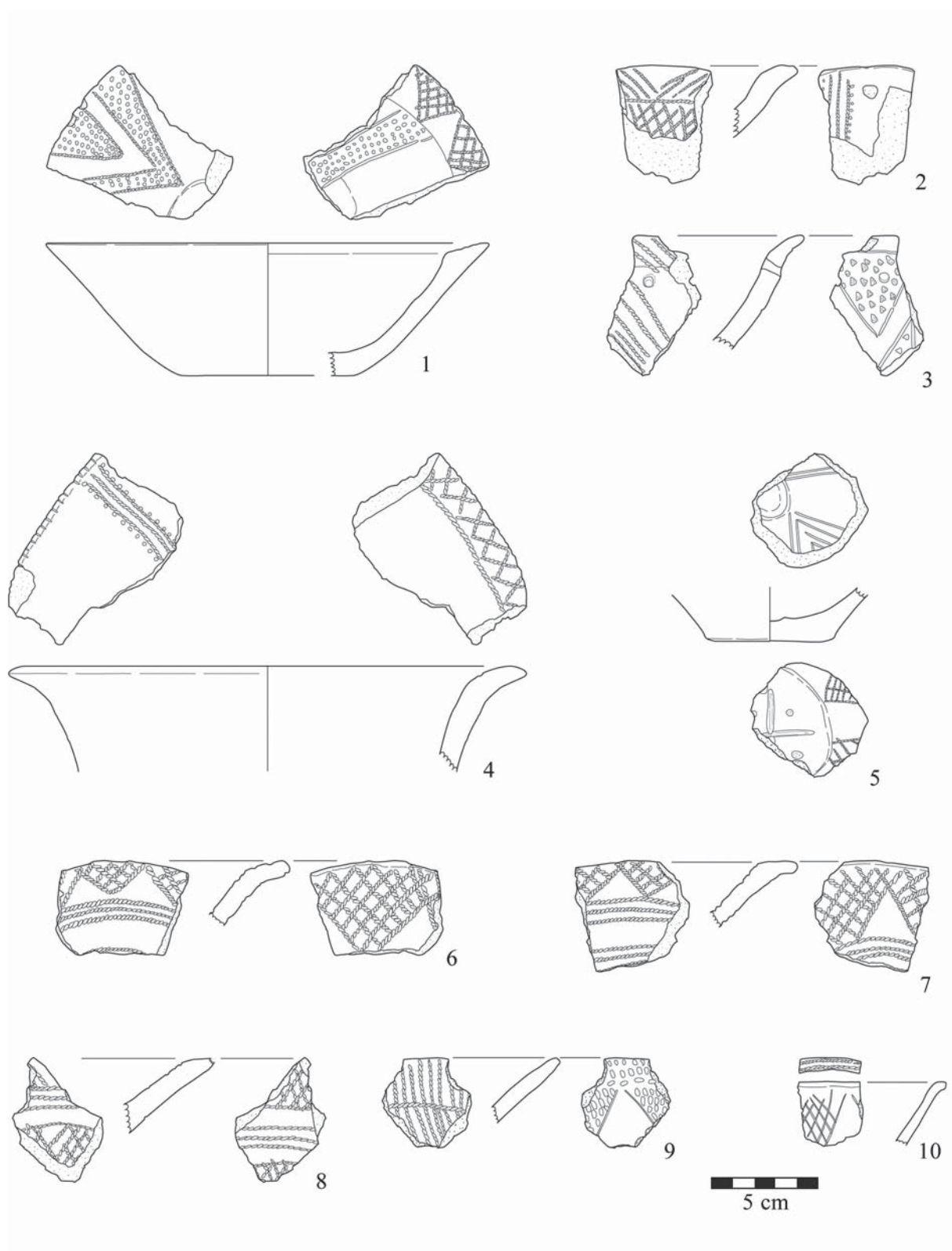


Fig. 4. Cord-decorated pottery in EBA 1b in Upper Thrace. 1–5. Ezero, 6–8. Dyadovo, 9–10. Sokol Himitliyata (drawing by the author)

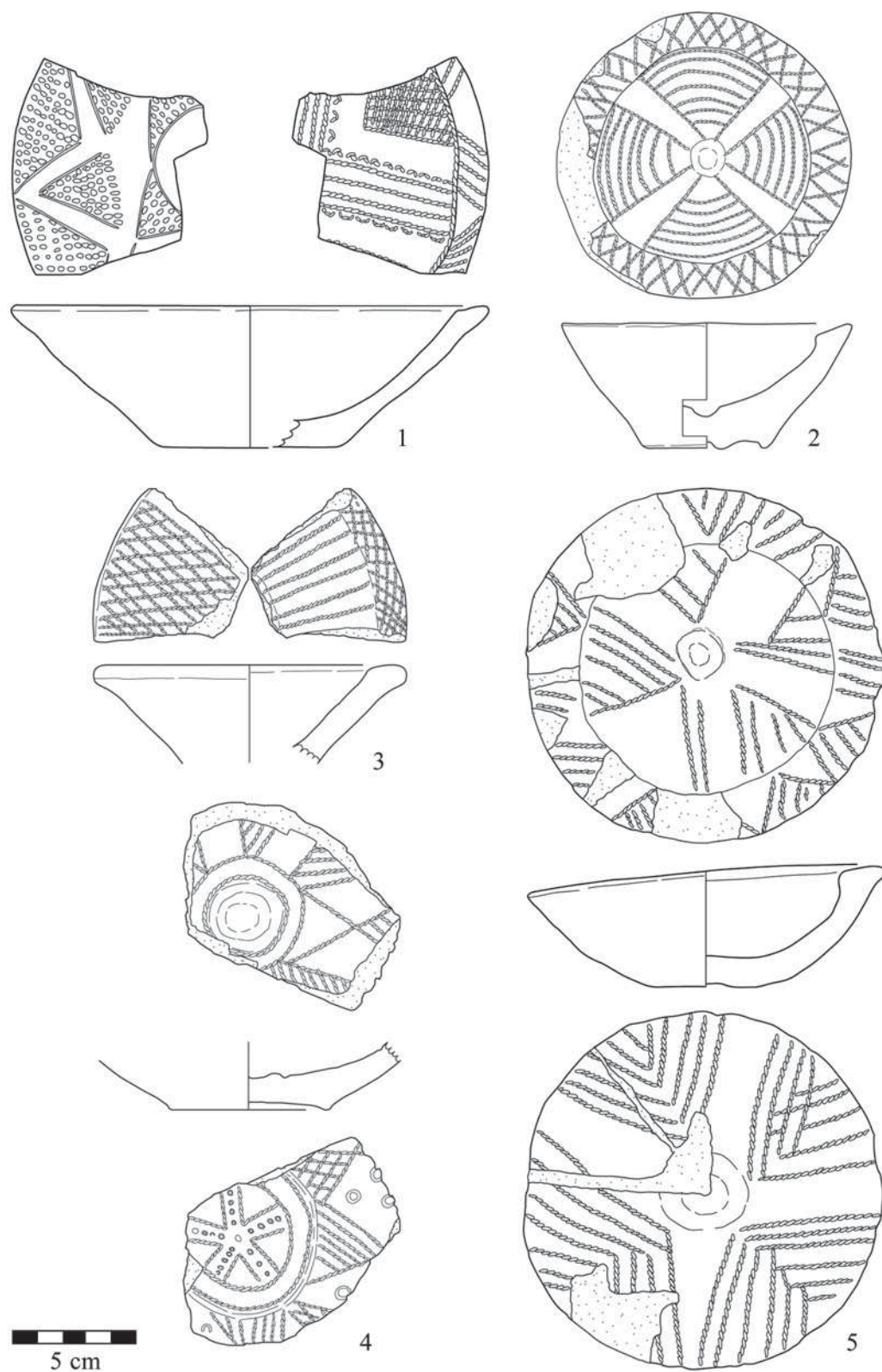


Fig. 5. Cord-decorated pottery from Ovcharitsa II, Karnobat, and Drazhevo-Sabev bair belonging to the EBA1b or early EBA 2. 1. Ovcharitsa II, 2–3. Karnobat, 4–5. Drazhevo-Sabev bair (drawing by the author)

contemporary with the EBA 2 in Upper Thrace. Thus, neither western Upper Thrace nor northern Greece is likely to be the source of the spread of the cord decoration technique to eastern Upper Thrace in the EBA.

Table 2. Ratio between S- and Z-twisted cords and amount of the fine and coarse S-twisted cords from EBA sites in Upper Thrace analysed in this study

Region	Site	Layer/Level/ Context	Sample size	S	Z	S width ≤2.0 mm	S width >2.0 mm
Eastern Upper Thrace	Ezero	Building level 11–9	16	81%(n=13)	19% (n=3)	85%	15%
	Dyadovo	Building level 14–9	5	100%(n=5)	0	80%	20%
	Sokol Himitriyata	Building level IV	2	100%(n=2)	0	100%	0%
	Okhcharitsa II	Layer I (EBA1b~2)	2	100%(n=2)	0	50%	50%
	Karnobat	Horizon 1 (EBA1b~2)	2	100%(n=2)	0	100%	0%
	Drazhevo- Sabev bair	Graves (EBA1b~2)	2	100%(n=2)	0	50%	50%
Western Upper Thrace	Yunatsite	Building level 15–4	12	8%(n=1)	92% (n=11)	100%	0%

Exploring the chronology of cord decoration on pottery west of the Black Sea

The cord decoration technique in Upper Thrace should be derived from the north. In the steppes north and west of the Black Sea, the accumulated ^{14}C dates of the Yamnaya culture indicated the period between the late 4th millennium BC and the middle 3rd millennium BC (RASSAMAKIN – NIKOLOVA 2008; HEYD 2011, 541; FRÎNCULEASA 2020a, Fig. 5). New AMS dates of the Yamnaya tumuli in the Bulgarian region illustrated that the Yamnaya culture occurred simultaneously with the EBA settlements in Upper Thrace (KAISER – WINGER 2015, 127–128). Other researchers noted that pottery with cord decoration postdates 3000 cal BC in Yamnaya graves, often found in secondary burials, located in southern Romania and Transylvania (FRÎNCULEASA – PREDA – HEYD 2015, 67, Fig. 17; DIACONESCU 2020, 26), despite the lack of direct ^{14}C dates of the Yamnaya graves that contained cord-decorated pottery.

A limited number of ^{14}C dates have been published for Yamnaya graves with cord-decorated pottery in the northwestern Black Sea region. Grave no. 8 with one cord-decorated vessel, exposed from the third embankment of Mayaki Mound 1, was estimated to date back to the second half of the 4th millennium BC (IVANOVA – PETRENKO – VETCHINNIKOVA 2005, 124–125). The basis for this assumption was that the ^{14}C date of the sample from grave no. 9 found in the sixth embankment, posterior to grave no. 8, covered the second half of the 4th millennium BC (3500–3150 cal BC) (IVANOVA 2013b, 213). However, since the age value ascribed to grave no. 9 has been questioned as being too old, the date of grave no. 8 remains unsure (RASSAMAKIN – NIKOLOVA 2008, 63). Apart from Mayaki, *Table 3* shows the six ^{14}C dates of the graves with cord-decorated pottery I observed. Except for grave no. 10 of Sychavka Mound 1, the date of which covers the early 2nd millennium BC, the five dates correspond to the EBA 2 or EBA 3 in Upper Thrace. In addition, two graves (nos. 16 and 18) in Semenovka Mound 8, containing pottery with S-twisted cord decoration, were built posterior to graves no. 8 and 13 (SUBBOTIN 1985, 62–73),

which were radiocarbon-dated to 3315–2916 cal BC and 3093–2911 cal BC (2σ), respectively. Thus, there is insufficient proof to demonstrate that pottery with cord decoration from Yamnaya graves in the northwestern Black Sea region coincided with the EBA 1 in Upper Thrace.

Table 3. Calibrated dates (2σ) of samples from Yamnaya graves in northwestern Black Sea region.

** shows no data about standard deviation*

Site name	Mound no.	Grave no.	Lab. No.	BP	cal BC 2σ	Reference
Efimovka	2	14	not available	not available	2750–2550*	IVANOVA – PETRENKO – VETCHNNIKOVA 2005, 127
Novoselitsa	19	19	Ki-7127	4055±60	2870–2470	IVANOVA – TOSCHEV 2015, 20
Novoselitsa	19	19	Ki-7085	4180±60	2900–2580	IVANOVA 2013b, Tab. 1
Sychavka	1	10	Ki-17906	3340±70	1870–1450	IVANOVA 2013b, Tab. 1
Sychavka	1	15	Ki-16610	3960±80	2850–2200	IVANOVA 2013c, Tab. 2
Vapnyarka	4	16	Ki-15015	4050±60	2870–2460	IVANOVA – TOSCHEV 2015, 20

Pottery with cord decoration unearthed from the Coțofeni settlements in Transylvania and Oltenia has been recognised as a chronological benchmark of the late phase (ROMAN 1977, 193–195; ROMAN – DODD-OPRIȚESCU – JÁNOS 1992, 61; TUȚULESCU – TERTECI 2019, 417). The finds at Tarnava Mound 1 (Gravchovska Mogila) in northwestern Bulgaria and Silvașu de Jos Mound 3 in Transylvania demonstrated that the Coțofeni III stage stratigraphically preceded the Yamnaya burials (ALEXANDROV 2019, 86–87; DIACONESCU 2020, 36, Fig. 3). This stratigraphic appraisal is consistent with the ^{14}C dates of both cultures not only in southern Romania but in Transylvania; the Coțofeni III stage ranges between the final third of the 4th millennium BC and the beginning of the 3rd millennium BC, and Yamnaya culture in the first half of the 3rd millennium BC (DIACONESCU 2020, 23, Fig. 4; FRÎNCULEASA 2020a, 51).

Cernavoda I–III cultures developed throughout the 4th millennium BC in the Lower Danube valley adjacent to the Coțofeni cultural area. Few sites revealed a stratigraphic relationship among the three cultures. Recent research has indicated that while the ^{14}C dates of Cernavoda I and III cultures fall in the early and middle 4th millennium BC (GLESER 2011, Abb. 7; GOVEDARICA – MANZURA 2015, 442), the Cernavoda II culture occurred synchronously with the Coțofeni III stage in the Lower Danube valley and the EBA 1 in Upper Thrace (FRÎNCULEASA 2020a, 53).

The artifacts from the Cernavoda II culture bear witness to close connections with the submerged settlement sites, such as Ezerovo II and Kiten–Urdoviza, along the Bulgarian Black Sea coast, according to some scholars (TONCHEVA 1981, 60–62; DIMITROV – DRAGANOV – PRAHOV 2020, 234). While the submerged settlement sites yielded a certain number of vessels with cord decoration, the ^{14}C dates fit well with the range between 2900 and 2500 cal BC (GÖRSDORF – BOJADŽIEV 1996, 157). Albeit still disputably, they could then be assigned to the EBA 2 in Upper Thrace.

Two regional groups – Usatovo and Horodiște-Gordinești – of the Late Tripolye culture (CII stage) are characterised by coarse ware with cord decoration and fine ware with painted decoration (DERGACHEV 1980; KRUTS 2012). The Usatovo group consists mainly of burial mounds and flat cemeteries in the northwestern Black Sea region. The chronological order of the Usatovo group and Yamnaya culture has been attested by the inner stratigraphy of the graves in the earthen tumuli (e.g., Holodnaya Balka Mound 1, Neruşaj Mound 9, Trapovka Mound 1). Although existing radiocarbon dates of the Usatovo group are questionable and require caution (DIACHENKO – HARPER 2016, 89; MANZURA 2020, 74–75), a calibrated date range of approximately 30 selected samples could be placed into 3500–2900 cal BC (PETRENKO – KAISER 2011, 55, 57, Ris. 1; DIACHENKO – HARPER 2016, Fig. 3, Tab. 1) and overlap with the EBA 1

dates in Upper Thrace. Chronologically, the Zhivotilovka group has been allocated between the Usatovo group and the Yamnaya culture, namely the fourth quarter of the 4th millennium BC, based on the typological parallels of the painted pottery and several ¹⁴C dates (RASSAMAKIN 1999, 92, 97; MANZURA 2016, 153, 166; 2020, 76). Nevertheless, there is no detailed information on the cord-decorated pottery among the characteristic cultural elements of the group represented by the burial mounds distributed between the Lower Don and the Lower Danube valleys.

The second group, Horodiște-Gordinești, occupied the upper and middle Dniester–Prut interfluvium to the north and mainly comprised flat settlements (DERGACHEV 1980, 119, *Ris.* 27; IVANOVA – TOSCHEV 2015, 335, *Fig.* 2; DIACHENKO – HARPER 2016, *Fig.* 1). Since fewer archaeological data on funerary rituals have been recovered, it is difficult to find comparable evidence of the stratigraphic relationship between the Horodiște-Gordinești group and the Yamnaya culture. Twenty radiocarbon dates also enable the placement of this group at 3300–2900 cal BC (DIACHENKO – HARPER 2016, 88, *Fig.* 3, *Tab.* 1; SÎRBU – KRÓL – HEGHEA 2019–2020, 130, *Tab.* 1) and demonstrate overlaps with ¹⁴C dates of the EBA 1 in Upper Thrace, similar to the Usatovo group.

Analysing cord impression on pottery

The results indicated that the dates of Coțofeni III, Cernavoda II, Usatovo, and Horodiște-Gordinești cover the period of the EBA 1b in Upper Thrace, while there are no positive dates for the Yamnaya burials with cord-decorated pottery except for one recently discovered at grave no. 5 of Chudomir Mound 2 in northeastern Bulgaria (ALEXANDROV 2021, *Pl.* 1). Since the absolute dates alone do not reveal the cultural interrelation between Upper Thrace and the above archaeological entities, it is necessary to clarify the relationship between them by comparing their data of the cord decoration technique (*Table 4*).

*Table 4. Sample size and relative frequencies of cord types observed on vessels or fragments with cord-decoration of the archaeological entities examined in this study. * indicates that seven samples were counted twice because each specimen had two multiple cord types*

Archaeological entity	Site	Context	Sample size	Wrapped	Wrapped&Z	Z	S	Z&S
Yamnaya (western Black Sea)	5	Graves	9	0%	0%	67%	33%	0%
Yamnaya (northwestern Black Sea)	30	Graves	60*	0%	0%	50%	40%	10%
Coțofeni	4	Settlements & Graves	32	31%	0%	44%	25%	0%
Cernavoda II	2	Graves	5	20%	0%	40%	20%	20%
Usatovo	13	Graves	97	16%	31%	52%	1%	0%
	1	Settlement	1430	43%	28%	29%	0%	0%
Horodiște-Gordinești	6	Settlements	200	0%	0%	6%	94%	0%

Most pottery vessels with cord decoration discovered in Yamnaya burials in the Lower Danube valley are beakers, pots, and Budzhak pots with simple motifs (*Fig. 6*) (FRÎNCULEASA – PREDA – HEYD 2015, *Fig.* 13). Of the nine vessels, six vessels from graves no. 4, 6, and 8 of Independența Mound 4, grave no. 15 of Ploiești-Triaj Mound 2, and graves no. 3 and 4 of Gurbănești Mound 2 (ROSETTI 1959,

Fig. 8) were decorated with Z-twisted cord. In addition, three vessels with S-twisted cord decoration were found in Yamnaya burials: grave no. 20 of Ploiești-Triaj Mound 2, and grave no. 2 of Blejoi Mound 4, and grave no. 1 of Tarnava Mound 2. For Ploiești-Triaj, the width of the S-twist was very

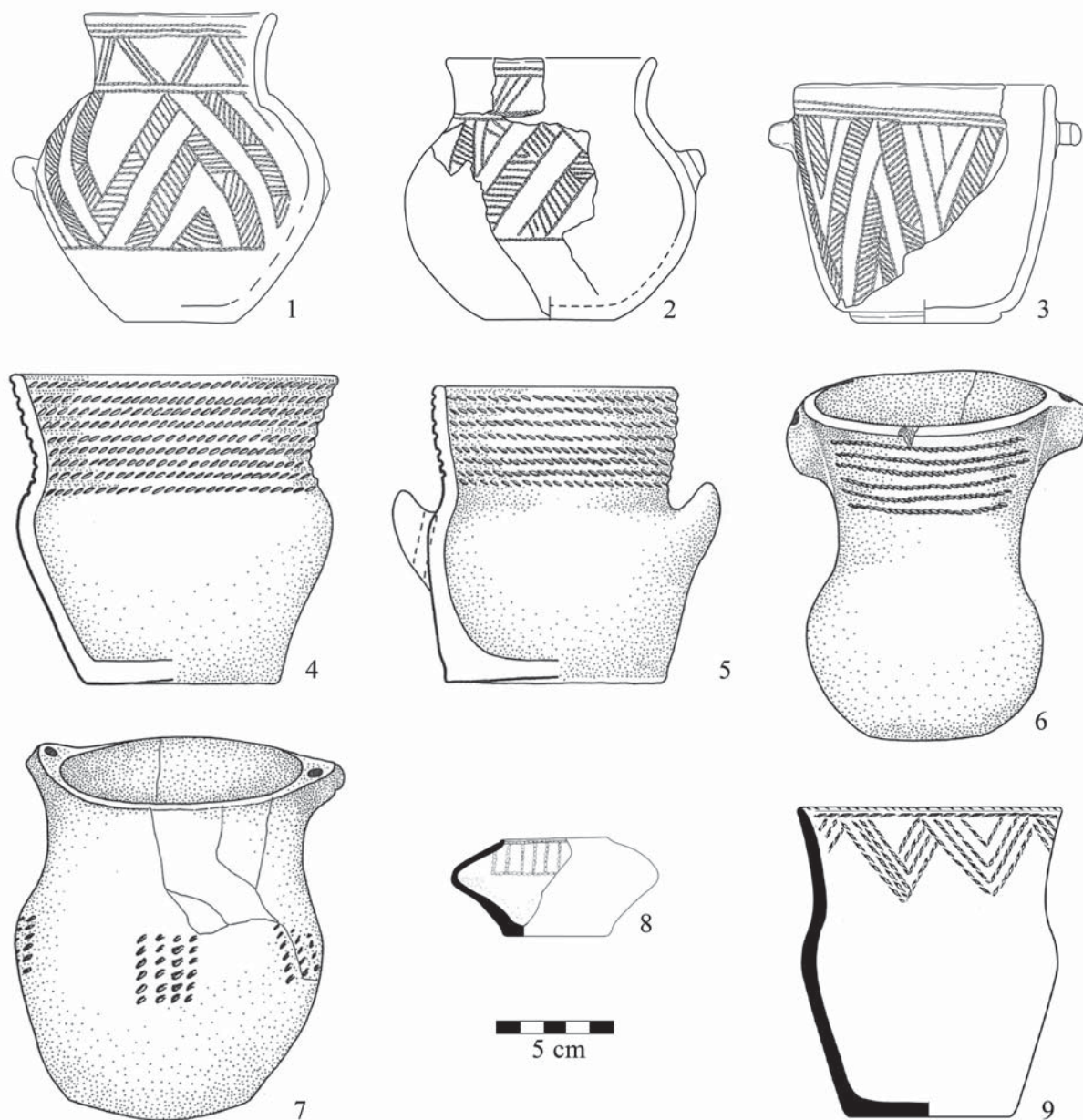


Fig. 6. Cord-decorated pottery of Yamnaya culture in the western Black Sea region. 1. Independența Mound 4, grave no. 8, 2. Independența Mound 4, grave no. 6, 3. Independența Mound 4, grave no. 4, 4. Ploiești-Triaj Mound 2, grave no. 20, 5. Ploiești-Triaj Mound 2, grave no. 15, 6. Gurbănești Mound 2, grave no. 4, 7. Gurbănești Mound 2, grave no. 3, 8. Blejoi Mound 4, grave no. 2, 9. Tarnava Mound 2, grave no. 1 (1–3. drawn by the author, 4–7. after ROMAN – DODD-OPRIȚESCU – JÁNOS 1992, Taf. 64: 1, 2, 5, 8. after FRÎNCULEASA et al. 2019, Pl. VIII: 6, 9. after ALEXANDROV 2019, Pl. VII: 9)

coarse—3.6 mm. Although I did not measure the width for Blejoi and Tarnava, the cord appeared coarse (FRÎNCULEASA *et al.* 2019, Pl. VIII: 5).

Yamnaya burials in the northwestern Black Sea region have yielded more pottery with cord decoration (Fig. 7) (SUBBOTIN 2000, 362, Ris. 4; IVANOVA 2013b).



Fig. 7. Cord-decorated pottery of Yamnaya culture in the northwestern Black Sea region. 1. Sergeevka Mound 11, grave no. 7, 2. Efimovka Mound 2, grave no. 14. 3. Sychavka Mound 1, grave no. 15, 4. Chervonyi Yar Mound 1, grave no. 2, 5. Kurci Mound 3, grave no. 8, 6. Glubokoe Mound 2, embankment layer, 7. Semenovka Mound 8, grave no. 18, 8. Vishnevoe Mound 11, grave no. 4 (photograph by the author)



Fig. 8. Bundle-cord decoration on pottery of Yamnaya culture. 1. Efimovka Mound 2, grave no. 14, 2. Sergeevka Mound 11, grave no. 7, 3. Frikatsey Mound 10, grave no. 14 (photograph by the author)

Eleven of 53 vessels from 30 Kurgans employed bundle-cords (Fig. 8). Six of these vessels were decorated with bundle-cords consisting of different S- and Z-twisted cords, and the other five with bundle-cords of the same twist direction, each consisting of four S-twisted and one Z-twisted cords. In addition, one Budzhak pot from grave no. 7 of Sergeevka Mound 11 was decorated with bundle-cord consisting of different S- and Z-twisted cords and another was decorated with Z-twisted cord (Fig. 8.2). A total of 60 data points on the twist direction and width of the cord obtained from 53 vessels indicated that there was no significant difference in the ratio between Z- and S-twisted cords. The width of the S-twisted cord ranged from 1.1 mm to 3.1 mm and the average value was about 2.0 mm.

When examining the Coțofeni culture, I observed 32 fragments from four sites. Of these, 28 were from Ocele Mari *Aval Baraj* in Oltenia, and one or two fragments came from the other three sites: Ocnîța-Cosota, Milostea, and Grădișteța-Coslogeni. I assigned the find from Grădișteța-Coslogeni located in Muntenia to the Coțofeni-style (FRÎNCULEASA 2020a, 52). All the vessels can be dated to the Coțofeni III stage (TUȚULESCU 2016, 207–208; FRÎNCULEASA 2020a). The characteristic of this stage is the pots and cups with the hatched-triangle motif. Fourteen fragments had Z-twisted cords, followed by ten fragments with wrapped cord and eight with S-twisted cord (Fig. 9.1–4). Most of the S-twisted cords were more than 2.0 mm wide, with an average of 2.25 mm.

In contrast to the Cernavoda I culture, cord decoration is much rarer in the Cernavoda II culture (FRÎNCULEASA 2020b, 157). Five vessels with cord decoration around the early 3rd millennium BC were recovered from two flat cemeteries (Fig. 9. 5–8) (FRÎNCULEASA 2020b, 157). At Brăilița, two beakers and one handled-bowl with horizontal lines and/or zigzag patterns were found in three burials (graves no. 8, 34, 144). The vessels in graves no. 8 and 144 were decorated with Z-twisted cord and that in grave no. 34 with wrapped cord. At Lișcoteanca-Movila Olarului, two vessels with multiple wavy lines or arches were excavated from graves no. 1 and 4. An S-twisted cord was visible on the pottery from grave no. 1, and S- and Z-twisted cord on that from grave no. 4. Two S-twisted cords measured 1.5 and 2.4 mm in width.

For the Usatovo group, I observed 97 vessels from 13 burial sites and 1430 fragments from a settlement at Usatovo. Spherical pots and jars with crescent motifs and horizontal linear patterns were typical of the Usatovo group (Fig. 10). Although the wrapped cord also made up a large proportion of the cord type and the bundle-cord of the same twist direction was observable, it is noteworthy that the cord-decorated pottery of the Usatovo group was almost entirely dominated by Z-twisted cord when compared to the presence of S-twisted cord (Table 4).

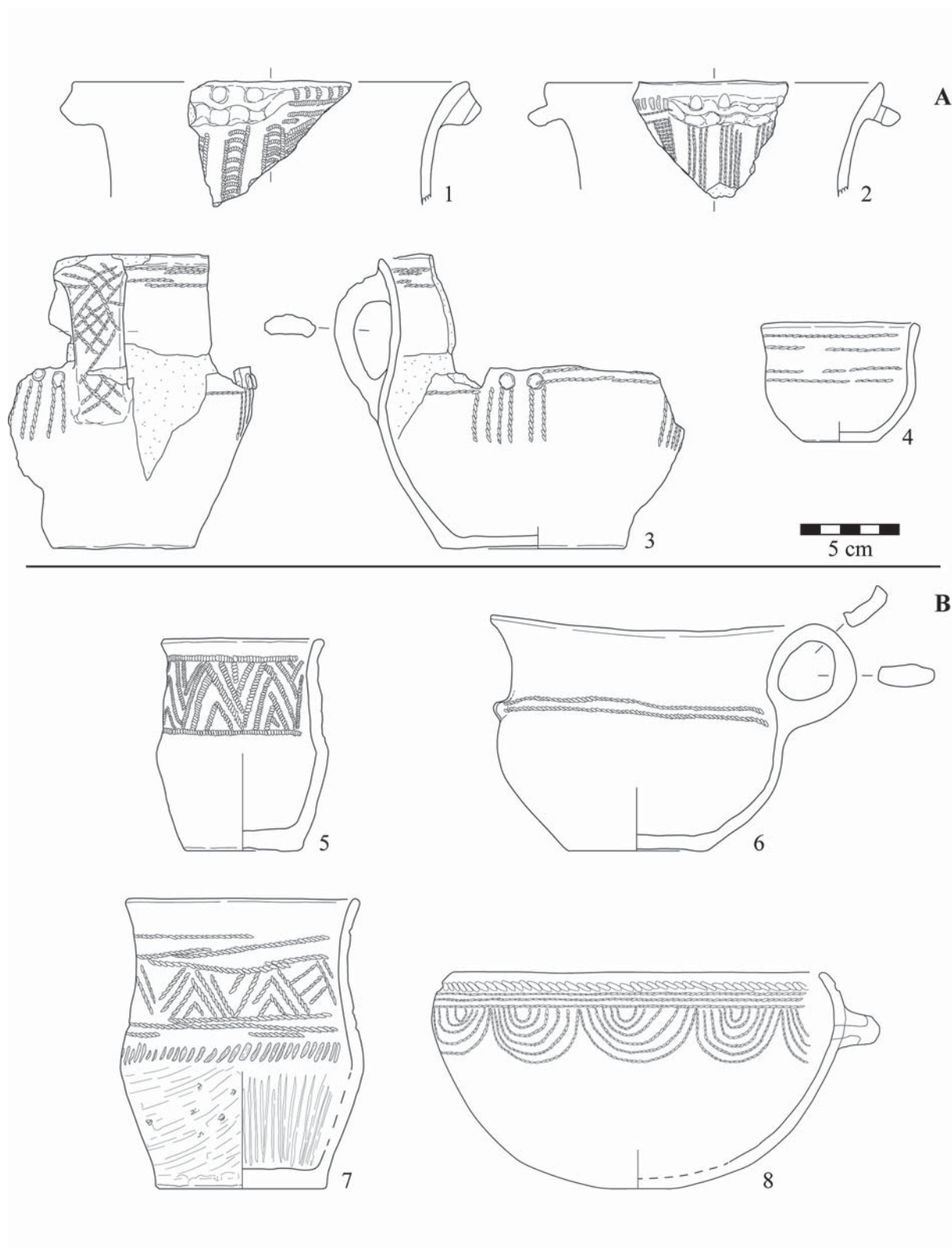


Fig. 9. Cord-decorated pottery of Coțofeni III and Cernavoda II cultures. A. 1. Ocnele Mari Aval Baraj, 2. Ocnîța-Cosota, 3–4. Grădișteța-Coslogeni, B. 5. Brăilița grave no. 34, 6. Brăilița grave no. 144, 7. Brăilița grave no. 8, 8. Lișcoteanca grave no. 4 (drawing by the author)



Fig. 10. Cord-decorated pottery of Usatovo group. 1. Usatovo, Kurgan Complex II, Mound 9, grave no. 2, 2. Usatovo, Kurgan Complex II, Mound 9, grave no. 1, 3. Usatovo, Flat Cemetery no. 3, ritual pit no. 2, 4. Usatovo, Kurgan Complex II, Mound 6, grave no. 4, 5. Usatovo, Kurgan Complex I, Mound 12, grave no. 1, 6. Usatovo, Kurgan Complex I, Mound 12, grave no. 3 (photograph by the author)

For the Horodiște-Gordinești group, I observed 200 fragments from six settlement sites. Typically, the shallow hemispherical bowls with thickened rims display linear patterns (*Fig. 11*). In sharp contrast to the Usatovo group, there is no evidence of wrapped cord. Moreover, most are S-twisted (94%), and the rest Z-twisted (6%). S-twisted cord-width ranges from 0.9 to 3.2 mm, and approximately 70% belong to the “fine” category (≤ 2.0 mm).

Discussion

This study analysed the cord decoration on pottery regarding cord type, twist direction, and width in southeastern Europe. The results indicated that the Coțofeni and Cernavoda II cultures of the Lower Danube valley have no strong connections with Upper Thrace. Although the analysed materials do not necessarily represent all the characteristics of the Coțofeni culture, it is possible to find clear distinctions from those of Upper Thrace; namely, the wrapped cord seen in the Coțofeni III stage is not typical in the Upper Thrace. The S-twisted cords are least prevalent in Coțofeni III, and the width of the S-twisted

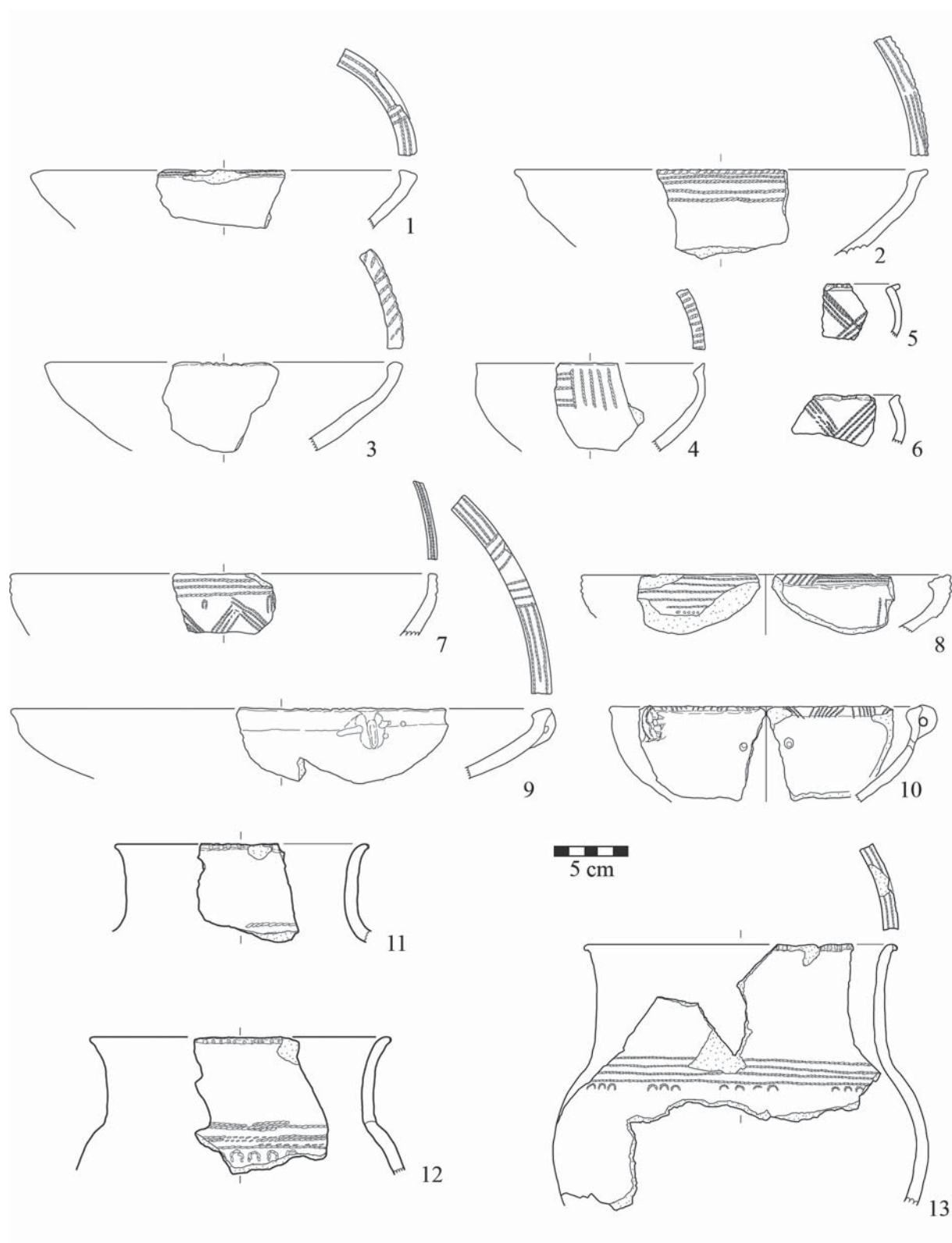


Fig. 11. Cord-decorated pottery of Horodiște-Gordinești. 1, 3, 4, 12. Gordinești II-Stînca Goală, 2, 13. Trinca-Izvorul lui Luca, 5, 6. Erbiceni-Dealul Sărăturii, 7. Mereșeuca I-Cetățuie, 8–11. Horodiște-Dealul Mălăiște (drawing by the author)

is coarser than that in the Upper Thrace. The analysed cord decoration in the Coțofeni culture hardly postulates any connections between the Coțofeni and the Thracian cord decoration.

Moreover, the Cernavoda III culture was not relevant to the root of the Thracian cord decoration because this entity predates the Cernavoda II culture and does not overlap with the EBA 1b in Upper Thrace. Furthermore, due to the difference in cord decoration technique, cord-decorated pottery from three graves at Brailița, of the Cernavoda II culture, have no connection with that of Upper Thrace. While the S-twisted cord decoration of grave no. 1 at Lișcoteanca is coarse, the cord decoration of grave no. 4 is fine (1.5 mm). Some suggested that graves no. 1 and 4 of Lișcoteanca belong to the younger Katacombnaya culture (IVANOVA 2013b, 244; AILINCĂI *et al.* 2021, 225). Given the fore-going evidence, the cord decoration of Cernavoda II culture is unlikely to be the prototype of the Thracian cord decoration.

The cord decoration of the Usatovo group in the northwestern Black Sea region is also not comparable to that of Upper Thrace. The wrapped cord comprises a certain ratio of the cord types of the Usatovo group, such as the Cernavoda I and Coțofeni cultures. More importantly, it should be emphasised that the Z-twisted cord was exclusively employed. The main features of the cord decoration technique clearly distinguish the Usatovo group from Upper Thrace. Thus, it is possible to argue that the Usatovo group has little to do with the cord-decorated pottery of the EBA 1b in Upper Thrace.

The Yamnaya culture in the western Black Sea region has only a few S-twisted cord decorations on pottery: three vessels and fragments from Ploiești-Triaj, Tarnava, and Blejoi were dated to the 3rd millennium BC (FRÎNCULEASA – PREDĂ – HEYD 2015; ALEXANDROV 2019, 88; FRÎNCULEASA *et al.* 2019, 48). Their coarser cords do not positively support the interrelationship with the fine S-twisted cord decoration of Upper Thrace in the EBA 1b.

Although the northwestern Black Sea region yielded more pottery with cord decoration than the western Black Sea region, there is little reliable evidence that the cord decoration was brought to Upper Thrace in the EBA 1b. The ¹⁴C dates of the five burials found in the Yamnaya tumuli with cord-decorated pottery indicated age values of the EBA 2, EBA 3, and even younger, regardless of the twist direction. Hence, these ¹⁴C dates do not support the interpretation that the Yamnaya groups brought the cord decoration on pottery to Upper Thrace.

Another reason the Yamnaya culture cannot be considered suitable is the difference in the cord decoration technique. While Upper Thrace in the EBA 1b is characterised by the predominance of fine S-twisted cord decoration, the Yamnaya cord decoration shows a similar ratio of S-twisted and Z-twisted cords. Seventeen of 27 samples (63%) of the S-twisted are thin cords of 2.0 mm or less. Ten of them were on Budzhak pots and spherical jars with bundle-cord decoration. Although the pottery decorated with the bundle-cord technique is occasionally encountered in the Usatovo group and the Katacombnaya culture of the northwestern Black Sea region, and in the Corded Ware culture (IVANOVA 2013c, 111), there is no proof thereof in Upper Thrace. In addition to the relationship with the Usatovo group as mentioned earlier, the chronological position of the Corded Ware and Katacombnaya cultures coincides with the EBA 2 and EBA 3 in Upper Thrace (FURHOLT 2004, 485–486; WŁODARCZAK 2006, Fig. 54). Therefore, arguments based on the bundle-cord technique of the Yamnaya culture do not favor the spread of the cord decoration technique into Upper Thrace.

Two vessels of the remaining seven data samples were from burials with ¹⁴C dates between 2850–2200 cal BC (grave no. 14 of Efimovka Mound 2 and grave no. 15 of Sychavka Mound 1). The other five vessels (grave no. 2 of Chervonyi Yar Mound 1, embankment layer of Glubokoe Mound 2, grave no. 8 of Kurci Mound 3, grave no. 18 of Semenovka Mound 8, grave no. 4 of Vishnevoe Mound 11) can also be dated later than 3000 cal BC (Fig. 7). First, the pottery from Glubokoe Mound 2 has decorations with a combination of triangles filled with oblique lines under the multiple lines arranged from the rim to the

shoulder, parallels of which have been found not only in the Yamnaya culture but in the Katacombnya and Corded Ware cultures (PUSTOVALOV 1999, *Ris.* 10: 9, 10, 12; WŁODARCZAK 2006, Pl. LXXVIII:4, LXXXII:1). In Semenovka Mound 8, pottery with cord decoration from grave no. 16 constructed in the same stratigraphic layer as grave no. 18 was found with a stone shaft-hole hammer-axe as grave goods analogous to the production in the Corded Ware culture (IVANOVA 2013b, 243). The star-shaped motif on the bottom of the cord-decorated vessel from grave no. 8 of Kurci Mound 3 is similar to that of the Katacombnya culture, for example, in grave no. 12 of Holodnaya Balka Mound 1 (PETRENKO 2010, Tab. 6:2). Grave no. 4 of Vishnevoe Mound 11, dug in from the upper part of the fourth embankment layer, was set above the Yamnaya graves and ascribed to the Mnogovalikovaya Pottery culture (DVORJANINOV – DZIGOVSKIY – SUBBOTIN 1985, 137). The Budzhak pot from grave no. 2 of Chervonyi Yar Mound 1 has a characteristic “ledge” between the bottom and lower part of the inside. Parallels are observable in grave no. 5 of Yasski Mound 2, grave no. 15 of Nagornoe Mound 14, and grave no. 3 of Novaya Dolina Mound 3. Notably, the ¹⁴C date (Ki-17902) of wooden wheels recovered from grave no. 2 of Yasski Mound 2 (ALEXEEVA 1992) falls within the range of 2860–2470 (2σ) (IVANOVA 2013c, 119–120, Tab. 1). Because the Yamnaya grave (no. 2) was constructed in the embankment heaped on the primary burial of the late Chalcolithic period, grave no. 5 of Yasski Mound 2 is likely to be contemporary with or later than grave no. 2. Thus, the Budzhak pots with the inner “ledge” imply that the graves of Chervonyi Yar Mound 1 and Yasski Mound 2 can be dated to the second or third quarter of the 3rd millennium BC.

As indicated above, the prevailing explanation that the cord decoration in Upper Thrace originated from the Yamnaya culture lacks conclusive evidence in the western and northwestern Black Sea region. It appears that the Yamnaya culture was not relevant to the emergence of pottery with fine S-twisted cord decoration in the EBA 1b of Upper Thrace. Instead, the Horodiștea-Gordinești group of the Tripolye culture (CII stage) remains an affirmative archaeological entity because of the overlapping ¹⁴C dates and similar characteristics to the cord decoration technique. However, the Horodiștea-Gordinești group did not make small shallow bowls with oblique lattice-filled geometric patterns, similar to the Upper Thracian group. This demonstrates that the Horodiștea-Gordinești group did not transport the pottery with cord decoration to Upper Thrace but transmitted the cord decoration technique.

This supposition raises another question: How did the cord decoration technique reach Upper Thrace? The Horodiștea-Gordinești group, who did not follow tumulus burial practices, left little archaeological evidence, except for the cord decoration on pottery, between the Dniester–Prut river valley and Upper Thrace. Notwithstanding, there are a few positive findings that imply human mobility over long distances. A good example is marine shell beads, probably *Dentalium* shells, found in the Gordinești-style vessel at Tsviklovtsy in the upper Dniester valley (IVANOVA – TOSCHEV 2015, 342; FRÎNCULEASA 2020a, 46). Other *Dentalium* shell products from the Tripolye CII stage have been spotted along the Lower Danube valley (FRÎNCULEASA 2020a, 46). The distribution of these marine shell products proves that various cultural contacts occurred between the upper Dniester River basin and the Aegean Sea. Such archaeological records, including funerary evidence, indicate the presence of other cultural groups that migrated from the northwestern Black Sea region to the Lower Danube valley, Upper Thrace, and possibly the northern Aegean region in the 4th millennium BC, before the arrival of the Yamnaya culture (ANTHONY 2007, 354; ALEXANDROV 2011; ALEXANDROV – KAISER 2016, 366; FRÎNCULEASA – MIREA – TROHANI 2017, 86–88; COLEMAN – FACORELLIS 2018). In the process of mutual communication, the Horodiștea-Gordinești group interacted with the Upper Thracian groups, resulting in the spread of the cord decoration to Upper Thrace.

The explanation that the local potters of Upper Thrace precisely imitated even the direction and width of the cord impression to decorate their pottery is perhaps debatable. The production process of cord-decorated pottery has not been fully elucidated because there is no published information about the

original cord itself or the workshops at the EBA sites in Upper Thrace. However, the characteristics of the pottery paste shed new light on the production of small shallow bowls with cord decoration. Petrographic and chemical analyses indicated that the small shallow bowls with S-twisted cord decoration from the EBA 1b building levels at Dyadovo and Sokol Himitliyata were made with different clay pastes from the local-style pottery in each settlement (SEMMOTO *et al.* 2018, 156–157). This leaves room for the interpretation that the small shallow bowls with fine S-twisted cord decoration were made from different raw materials and at places separate from the local pottery production in the EBA 1b, although further research is required.

Conclusion

This study discusses the emergence of cord decoration on EBA pottery in Upper Thrace, focusing on the chronological dates and typological characteristics, especially the cord decoration technique. The investigation of the cord-decorated pottery of Upper Thrace establishes that it did not originate from the Yamnaya culture. Instead, I propose a plausible alternative. It is highly probable that the southward migration of the Horodiștea-Gordinești group caused interactions with the local groups in Upper Thrace, with the result that the group from the Dniester–Prut river valley disseminated the fine S-twisted cord technique only and not any actual products to Upper Thrace. The faint traces of the Horodiștea-Gordinești groups in Upper Thrace may raise doubt that the cord-decoration technique alone can prove the connection between the two groups. However, the marine shell products stored in the Gordinești-style pottery evidently illustrated contact between the Horodiștea-Gordinești group and inhabitants of the southern Balkans. This may mean that the Horodiștea-Gordinești group was also one of the groups that traveled long distances in southeastern Europe.

I presumed the Horodiștea-Gordinești group as the archaeological entity that brought the first cord decoration on pottery to Upper Thrace. One of the reasons why this interpretation is more plausible is that, regardless of the characteristics of the cord for decoration, no data with sufficient ^{14}C dates have emerged among the Yamnaya burials with cord-decorated pottery in the northwestern and western Black Sea regions except the up-to-date findings at Chudomir. As the number of high-precision ^{14}C dates increases, it is necessary to consider the possibility that the Yamnaya population introduced the cord decoration technique to other groups. Discussing the theme is beyond the scope of this study, but the data of the Lower Danube valley do not seem to rule out its possibility. The dispersal of the cord decoration on pottery through migrations in the northwestern and western regions of the Black Sea from the late 4th to early 3rd millennium BC must have been more complex than expected.

As convenient as it may sound, there is no testimony that reveals the background of the Horodiștea-Gordinești group moving south with the cord decoration. One may think of the decline and collapse of the Tripolye culture in the northwestern Black Sea region around 3000 cal BC. However, there are numerous issues that require investigation before we can reveal the causality between the collapse of the Tripolye culture and the migration of the Horodiștea-Gordinești group. Furthermore, it is challenging to discuss the aDNA background, owing to the insufficient burial data of the EBA local groups in Upper Thrace. The conclusions of this study are still hypothetical and require further data accumulation and verification. Hence, in addition to further analysis of the cord-decorated pottery, we need to continue to work on precisely dating archaeological events and on approaches from other archaeological materials.

Acknowledgements

I would like to thank a lot of researchers and staff for providing me with occasions to approach the materials in academic institutions and museums in Bulgaria, Romania, Moldova, Ukraine, and Greece in 2015–2019. And I wish to specifically express my gratitude to the following: in Bulgaria, Krassimir Leshtakov at Sofia University “St. Kliment Ohridski”, Yavor Boyadzhiev and Georgi Ivanov at the National Archaeological Institute with Museums, Rossitsa Hristova at the Historical Museum of Karnobat, and Todor Valchev at the Historical Museum of Yambol; in Romania, Anca-Diana Popescu at the “Vasile Parvan” Institute of Archaeology, Alexander Rubel at the Iași Institute of Archaeology, and Vasile Cotiuga and Ștefan Caliniuc at the Alexandru Ioan Cuza University of Iași; in Moldova, Eugen Sava and Viaceslav Bicbaev at the National Museum of History of Moldova, and Sîrbu Ghenadie at the Academy of Sciences of Moldova; in Ukraine, Sergej Okhotnikov at the Odessa Archaeological Museum in Ukraine; and in Greece, Dimitra Malamidou at the Greek Ministry of Culture. Last but not least, I would like to express my gratitude to Volker Heyd and Bianca Preda-Bălănică at the University of Helsinki for giving me the opportunity to contribute my paper. I conducted the research within the framework of a project funded by the Takanashi Foundation for Historical Science. This study was supported by a Grant-in-Aid for Early-Career Scientists from the Japan Society for the Promotion of Science (grant no. 19K13399).

References

- AILINCAI, S.-C. – CONSTANTINESCU, M. – DIMA, A. – SAVA, G. – MIHAIL, F. – MICU, C. et al. 2021
Bronze Age graves at Jijila (Southeastern Romania) In: Heyd, V. – Kulcsár, G. – Preda Bălănică, B. (eds.): *Yamnaya Interactions. Proceedings of the International Workshop held in Helsinki, 25–26 April 2019*. The Yamnaya Impact on Prehistoric Europe, Vol. 2. Budapest 2021, 207–242.
- ALEXANDROV, S. 2011
Prehistoric Barrow Graves between the Danube and the Balkan Range. Stratigraphy and relative chronology. In: Borgna, E.– Müller-Celka, S. (eds.): *Ancestral Landscapes: Burial mounds in the Copper and Bronze Ages (Central and Eastern Europe – Balkans – Adriatic – Aegean, 4th–2nd millennium BC)*. Travaux de la Maison de l’Orient et de la Méditerranée 58. Lyon 2011, 307–320.
- ALEXANDROV, S. 2019
Early Bronze Age Barrow Graves in North-West Bulgaria. In: Filipović, V. – Bulatović, Al. – Kapuran, Al. (eds.): *Papers in Honour of Rastko Vasić’s 80th Birthday*. Belgrad 2019, 75–94.
- ALEXANDROV, S. 2021
Fourth/third millennium BC barrow graves in North-East Bulgaria (120 years of investigations). In: Heyd, V. – Kulcsár, G. – Preda-Bălănică, B. (eds.): *Yamnaya Interactions. Proceedings of the International Workshop held in Helsinki, 25–26 April 2019*. The Yamnaya Impact on Prehistoric Europe, Vol. 2. Budapest 2021, 271–314.
- ALEXANDROV, S. – KAISER, E. 2016
The early barrow graves in West Pontic Area. Cultures? Migrations? Interactions? In: Nikolov, V. – Schier, W. (Hrsg.): *Der Schwarzmeerraum vom Neolithikum bis in die Früheisenzeit (6000–600 v. Chr.). Kulturelle Interferenzen in der zirkumpontischen Zone und Kontakte mit ihren Nachbargebieten*. Prähistorische Archäologie in Südosteuropa 30. Rahden/Westfalen 2016, 359–370.

ALEXEEVA, I. L. 1992

Kurgany epokhi paleometalla v Severo-Zapadnom Prichernomore. Odessa 1992.

ALLENTOFT, M. E. – SIKORA, M. – SJÖGREN, K. G. – RASMUSSEN, S. – RASMUSSEN, M. – STENDERUP, J. et al. 2015

Population genomics of Bronze Age Eurasia. *Nature* 522 (2015) 167–172.

ANDERSSON STRAND, E. 2012

The textile chaîne opératoire: using a multidisciplinary approach to textile archaeology with a focus on the Ancient Near East. *Paléorient* 38 (2012) 21–40.

ANTHONY, D. W. 2007

The Horse, the Wheel and the Language. How Bronze Age Riders Shaped the World. Princeton – Oxford 2007.

BARBER, E. J. W. 1991

Prehistoric textiles: The development of cloth in the Neolithic and Bronze Ages, with Special Reference to the Aegean. Princeton 1991.

BOYADZHIEV, Y. – ASLANIS, I. 2016

Radiocarbon dates from Tell Yunatsite. In: Tsirtsoni, Z. (ed.): *The human face of radiocarbon: Reassessing chronology in prehistoric Greece and Bulgaria, 5000–3000 cal BC*. Lyon 2016, 157–166.

COLEMAN, J. E. – FACORELLIS, Y. 2018

The shadowy “proto-Early Bronze Age” in the Aegean. In: Dietz, S. – Mavridis, F. – Tankosić, Ž. – Takaoğlu, T. (eds.): *Communities in transition. The Circum-Aegean Area during the 5th and 4th millennia BC*. Oxford&Philadelphia 2018, 33–66.

DERGACHEV, V. 1980

Pamjatniki pozdnego tripolja. Kishinev 1980.

DIACHENKO, A. – HARPER, T. 2016

The absolute chronology of Late Tripolye sites: A regional approach. *Sprawozdania Archeologiczne* 68 (2016) 81–105.

DIACONESCU, D. 2020

Step by steppe: Yamnaya culture in Transylvania. *Praehistorische Zeitschrift* 95/1 (2020) 17–44.

DIMITROV, K. – DRAGANOV, V. – PRAHOV, N. 2020

Submerged Prehistoric Settlements along the South Bulgarian Black Sea Coast. In: Krauss, R. – Pernicka, E. – Kunze, R. – Dimitrov, K. – Leshtakov, P. (eds.): *Prehistoric Mining and Metallurgy at the Southeast Bulgarian Black Sea Coast*. Tübingen 2020, 185–245.

DVORJANINOV, S. A. – DZIGOVSKIY, A. N. – SUBBOTIN, L. V. 1985

Raskopki kurgannoj grupy u s. Vishnevoe. In: Stanko, V. N. (eds.): *Novye materialy po arkheologii Severo-Zapadnogo Prichernomorja*. Kiev 1985, 132–173.

FRÎNCULEASA, A. 2020a

Earthen burial mounds and the Coțofeni Culture south of the Carpathians. The archaeological research in Ariceștii-Rahtivani – Movila pe Răzoare. *Ziridava. Studia Archaeologica* 34 (2020) 35–90.

FRÎNCULEASA, A. 2020b

Cultura Cernavoda II la Dunărea Inferioară. Relevanța cronologiei și a înmormântărilor tumulare. *Studii de Preistorie* 17 (2020) 135–193.

FRÎNCULEASA, A. – MIREA, P. – TROHANI, G. 2017

Local cultural settings and transregional phenomena: on the impact of a funerary ritual on the Lower Danube in the 4th millennium BC. *Buletinul Muzeului Județean Teleorman. Seria Arheologie* 9 (2017) 75–116.

FRÎNCULEASA, A. – PREDA, B. – HEYD, V. 2015

Pit-graves, Yamnaya and kurgans along the Lower Danube: Disentangling 4th and 3rd millennium BC burial customs, equipment and chronology. *Praehistorische Zeitschrift* 90/1–2 (2015) 45–113.

FRÎNCULEASA, A. – PREDA-BĂLĂNICĂ, B. – SIMALCSIK, A. – NEGREA, O. – CONSTANTINESCU, B. – CRISTEA-STAN, D. 2019

Morminte Iamnaia într-un tumul redescoperit și salvat în localitatea Blejoi (jud. Prahova). *Buletinul Muzeului Județean Teleorman. Seria Arheologie* 11 (2019) 35–78.

FURHOLT, M. 2004

Entstehungsprozesse der Schnurkeramik und das Konzept eines Einheitshorizontes. *Archäologisches Korrespondenzblatt* 34 (2004) 479–498.

FURHOLT, M. 2021

Mobility and social change: Understanding the European Neolithic period after the archaeogenetic revolution. *Journal of Archaeological Research* 29 (2021) 481–535.

GEORGIEV, G. – MERPERT, N. – KATINCHAROV, R. – DIMITROV, D. 1979

Ezero. Rannobronzovoto selishte. Sofija 1979.

GIBSON, A. M. – WOODS, A. 1997

Prehistoric pottery for the Archaeologists. London 1997.

GIMBUTAS, M. 1970

Proto-Indo-European Culture: The Kurgan Culture during the fifth, fourth, and third millennia B.C. In: Cardona, G. – Hoenigswald, H. M. – Senn, A. (eds.): *Indo-European and Indo-Europeans*. Philadelphia 1970, 155–197.

GIMBUTAS, M. 1977

The first wave of Eurasian steppe pastoralists into Copper Age Europe. *Journal of Indo-European Studies* 5 (1977) 277–338.

GIMBUTAS, M. 1979

The three waves of Kurgan People into Old Europe, 4500–2500 BC. *Archives suisses d'anthropologie générale* 43 (1979) 113–137.

GLESER, R. 2011

Radiokarbondaten aus Drama. Stand der Forschungen bis zum Jahre 2010. *Studia Praehistorica* 14 (2011) 177–204.

GÖRSDORF, J. – BOJADŽIEV, J. 1996

Zur absoluten Chronologie der bulgarischen Urgeschichte: Berliner C-Datierungen von bulgarischen archäologischen Fundplätzen. *Eurasia antiqua* 2 (1996) 105–173.

GOVEDARICA, B. – MANZURA, I. 2015

The Copper Age settlement of Kartal in Orlovka (Southwest Ukraine). In: Hansen, S. – Raczky, P. – Anders, A. – Reingruber, A. (eds.): *Neolithic and Copper Age between the Carpathians and the Aegean Sea*. Bonn 2015, 432–456.

GRÖMER, K. – KERN, D. 2010

Technical data and experiments on Corded Ware. *Journal of Archaeological Science* 37 (2010) 3136–3145.

HAAK, W. – LAZARIDIS, I. – PATTERSON, N. – ROHLAND, N. – MALLICK, S. – LLAMAS, B. et al. 2015

Massive migration from the steppe was a source for Indo-European languages in Europe. *Nature* 522 (2015) 207–211.

HARRISON, R. J. – HEYD, V. 2007

The transformation of Europe in the Third Millennium BC: the example of ‘Le Petit-Chasseur I+III’ (Sion, Valais, Switzerland). *Praehistorische Zeitschrift* 82/2 (2007) 129–214.

HEYD, V. 2011

Yamnaya Groups and Tumuli west of the Black Sea. In: Borgna, E. – Müller-Celka, S. (eds.): *Ancestral Landscape. Burial mounds in the Copper and Bronze Ages (Central and Eastern Europe – Balkans – Adriatic – Aegean, 4th–2nd millennium B.C.)*. Travaux de la Maison de l’Orient et de la Méditerrané 58. Lyon 2011, 535–555.

HEYD, V. 2017

Kossinna’s smile. *Antiquity* 91 (2016) 348–359.

HURLEY, W. M. 1979

Prehistoric cordage: Identification of impressions on pottery. Taraxacum 1979.

ILIEV, I. K. – BAKÁRDŽIEV, S. 2020

Kurgane der Frühen bis Späten Bronzezeit im Bezirk Jambol. Südostbulgarien. In: Echt, R. – Heyd, V. – Preda-Bălănică, B. (Hrsg.): *The Yamnaya Impact on Prehistoric Europe*, Vol. 1. Budapest 2020.

IVANOVA, S. 2013a

Jamnaja (Budzhakskaja) kultura. In: Brujako, I. V. – Samojlova, T. L. (eds.): *Drevnie kultury Severo-Zapadnogo Prichernomorja*. Odessa 2013, 211–254.

IVANOVA, S. 2013b

Kulturno-istoricheskie kontakty naselenija Severo-Zapadnogo Prichernomorja v rannem bronzovom veke: Zapad-Vostok. *Stratum plus* 2013/2 (2013) 199–257.

IVANOVA, S. 2013c

Connections between the Budzhak culture and Central European groups of the Corded Ware Culture. *Baltic-Pontic Studies* 18 (2013) 86–121.

IVANOVA, S. 2014

Balkano-Karpatskij variant jamnoj kulturno-istoricheskij oblasti. *Rossijskaja arkheologija* 2014/2 (2014) 5–20.

IVANOVA, S. – PETRENKO, V. G. – VETCHINNIKOVA, N. E. 2005

Kurgany drevnikh skotovodov mezhdurechja Juzhnogo Buga i Dnestra. Odessa 2005.

IVANOVA, S. – TOSCHEV, G. N. 2015

The Middle-Dniester cultural contact area of Early Metal Age societies. The frontier of Pontic and Baltic drainage basins in the 4th/3rd–2nd millennium BC. *Baltic-Pontic Studies* 20 (2015) 331–397.

KAISER, E. – WINGER, K. 2015

Pit graves in Bulgaria and the Yamnaya Culture. *Praehistorische Zeitschrift* 90/1–2 (2015) 114–140.

KATINCHAROV, R. 1974

Periodizatsija i kharakteristika na kulturata prez bronzovata epokha v Juzhna Bulgarija. *Arkheologija* 16/1 (1974) 1–22.

KOSTADINOVA-AVRAMOVA, M. – KOVACHEVA, M. – BOYADZHIEV, Y. 2014

Contribution of stratigraphic constraints of Bulgarian prehistoric multilevel tells and a comparison with archaeomagnetic observations. *Journal of Archaeological Science* 43 (2014) 227–238.

KOTOVA, N. S. 2010

The first ‘Corded’ ceramics ornamentation of Eneolithic Steppe and Neolithic Forest-Steppe cultures. *Baltic-Pontic Studies* 15 (2010) 75–109.

KRISTIANSEN, K. – ALLENTOLT, M. – FREI, K. – IVERSEN, R. – JOHANNSEN, N. – KROONEN, G. et al. 2017

Re-theorising mobility and the formation of culture and language among the Corded Ware Culture in Europe. *Antiquity* 91/356 (2017) 334–347.

KRUTS, V. 2012

The Latest stage of development of the Tripolye Culture. In: Menotti, F. – Korvin-Piotrovskiy, A. G. (eds.): *The Tripolye Culture Giant–Settlements in Ukraine: Formation, Development and Decline*. Oxford 2012, 230–253.

LESHTAKOV, K. – KANCHEVA-RUSSEVA, T. – STOYANOV, T. 2001

Prehistoric studies. Settlement sites. *Maritsa-Iztok. Archaeological Research* 5 (2001) 15–68.

LESHTAKOV, K. – TSIRTSONI, Z. 2016

Caesurae in the Bronze Age Chronology of Eastern Bulgaria. In: Nikolov, V. – Schier, W. (Hrsg.): *Der Schwarzmeerraum vom Neolithikum bis in die Früheisenzeit (6000–600 v. Chr.). Kulturelle Interferenzen in der Zirkumpontischen Zone und Kontakte mit ihren Nachbargebieten*. Prähistorische Archäologie in Südosteuropa 30, Rahden/Westfalen 2016, 477–491.

LICHARDUS, J. – LICHARDUS-ITTEN, M. 1995

Nordpontische Beziehungen und ihre westlichen Nachbarn: Ein Beitrag zur Entstehung der frühen Kupferzeit Alteuropas. *Thracia* 11 (1995) 31–62.

MALLORY, J. P. 1989

In Search of Indo-European. London 1989.

MANZURA, I. 2016

North Pontic Steppes at the End of the 4th Millennium BC: the Epoch of Broken Borders. In: Zancini, A. – Kaiser, E. – Kashuba, M. – Izbitser, E. – Băţ, M. (eds.): *Man, culture and society from the Copper Age until the Early Iron Age in Northern Eurasia. Contributions in honour of the 60th anniversary of Eugen Sava*. Chişinău 2016, 149–171.

MANZURA, I. 2020

History carved by the dagger: the society of the Usatovo Culture in the 4th Millennium BC. In: Hansen, S. (Hrsg.): *Repräsentationen der Macht: Beiträge des Festkolloquiums zu Ehren des 65. Geburtstags von Blagoje Govedarica*. Wiesbaden 2020, 73–96.

MEYER, D. 2008

Der westpontische Raum am Ende der frühen Kupferzeit. Halle/Saale 2008.

MISHINA, T. N. 2011

Ornament rannbronzovoj keramiki tellja Junatsite. *Godishnik na regionalen istoricheski muzej Pazardzhik* 2 (2011) 69–82.

NIKOLOVA, L. 1994

Data on sea contacts during the Early Bronze Age in South-Eastern Europe (c. 3500/2400 – 2350/2250 BC). *Thracia Pontica* 5 (1994) 57–81.

NIKOLOVA, L. 1996

Settlements and ceramics: The experience of Early Bronze Age Bulgaria. *Reports of Prehistoric Research Projects* 1/2 (1996) 145–186.

PANAJOTOV, I. 1989

Jamnata kultura v balgarskite zemi. Razkopki i Prouchvanija 21. Sofija 1989.

PETRENKO, V. G. 2010

Kurgan epokhi paleometalla na poberezhe khadzhibejskogo limana. *Materialy po arkheologii Severnogo Prichernomorja* 11 (2010) 310–367.

PETRENKO, V. G. – KAISER, E. 2011

Kompleksnyj pamjatnik Majaki: novye izotopnye voprosy khronologii nalichnykh kul'tur. *Materialy po arkheologii Severnogo Prichernomorja* 12 (2011) 31–61.

PUSTOVALOV, S. ZH. 1999

Modelirovanie litsa po cherepu u naselenija ingulskoj Katakombnoj Kultury. *Stratum plus* 1999/2 (1999) 222–255.

RASSAMAKIN, Y. 1999

The eneolithic of the Black Sea Steppe: Dynamics of cultural and economic development 4500–2300 B. C. In: Levine, M. – Rassamakin, Y. – Kislenko, A. – Tatarintseva, N. (eds.): *Late prehistoric exploitation of the Eurasian Steppe*. Cambridge 1999, 59–182.

RASSAMAKIN, Y. – NIKOLOVA, A. V. 2008

Carpathian imports and imitations in context of the Eneolithic and Early Bronze Age of the Black Sea steppe area. In: Biehl, P. – Rassamakin, Y. Y. (eds.): *Import and imitation in archaeology*. Langenweißbach 2008, 51–87.

REINGRUBER, A. – RASSAMAKIN, J. 2016

Zwischen Donau und Kuban: Das nordpontische Steppengebiet im 5. Jt. v. Chr. In: Nikolov, V. – Schier, W. (Hrsg.): *Der Schwarzmeerraum vom Neolithikum bis in die Früheisenzeit (6000–600 v. Chr.). Kulturelle Interferenzen in der Zirkumpontischen Zone und Kontakte mit ihren Nachbargebieten*. Prähistorische Archäologie in Südosteuropa 30. Rahden/Westfalen 2016, 273–311.

ROMAN, P. 1977

Die Coțofeni-Kultur. *Praehistorische Zeitschrift* 52 (1977) 189–198.

ROMAN, P. – DODD-OPRIȚESCU, A. – JÁNOS, P. 1992

Beiträge zur Problematik der schnurverzierten Keramik Südosteuropas, Heidelberger Akademie der Wissenschaften, Internationale Kommissions, Erforschung der Vorgeschichte des Balkans 3. Mainz 1992.

ROSETTI, D. V. 1959

Movilele funerare de la Gurbănești (r. Lehliu, reg. București). *Materiale și cercetări arheologice* 6 (1959) 791–816.

SCHWENZER, S. 2005

Zum Beginn der Frühbronzezeit in Bulgarien. In: Horejs, B. – Jung, R. – Kaiser, E. – Terzan, B. (Hrsg.): *Interpretationsraum Bronzezeit. Bernhard Hänsel von seinen Schülern gewidmet*. Universitätsforschungen zur prähistorischen Archäologie 121, Bonn 2005, 181–198.

SEMMOTO, M. 2021

Early Bronze Age chronology and settlement at Dyadovo in the Upper Thracian Plain. In: Leshtakov, K. – Andonova, M. (eds.): *Galabovo in South-east Europe and beyond. Cultural interactions during the 3rd–2nd Millennium BC*. Sofia 2021, 98–113.

SEMMOTO, M. – KANNARI, T. – SHIBATA, T. – KAMURO, H. – LESHTAKOV, K. 2018

Petrographic and chemical characterization of Early Bronze Age pottery from Sokol- Himitliyata in Nova Zagora region: An interim report. *Studia Archaeologica Universitatis Serdicensis* 6/2016 (2018) 153–168.

SÎRBU, G. – KRÓL, D. – HEGHEA, S. 2019–2020

The Late Eneolithic groups from the Dniester–Prut interfluvium: Some questions of their external contacts and chronology. *Baltic-Pontic Studies* 24 (2019–2020) 104–139.

SUBBOTIN, L. V. 1985

Semenovskij mogilnik epokhi eneolita-bronzy. *Novye materialy po arkheologii Severo-Zapadnogo Prichernomorja*. Kiev 1985, 45–95.

SUBBOTIN, L. V. 2000

Severo-zapadnoe prichernomore v epokhu rannej i srednej bronzy. *Stratum plus* 2 (2000) 350–387.

TELEGIN, D. 1992

Zum Ursprung der Schnurverzierung, In: Buchvaldek, M. (Hrsg.): *Die kontinentaleuropäischen Gruppen der Kultur mit Schnurkeramik: Schnurkeramik-Symposium 1990*. Praha 1992, 333–339.

TONCHEVA, G. 1981

Un habitat lacustre de l' âge du bronze ancien dans les environs de la ville de Varna (Ezerovo II). *Dacia* 25 (1981) 41–62.

TUȚULESCU, I. 2016

Cultural interactions between the Coțofeni Culture and surrounding cultures in Oltenia during the transition from the Eneolithic to the Bronze Age. *Annales Universitatis Apulensis Series Historica* 20 (2016) 203–216.

TUȚULESCU, I. – TERTECI, C-C. 2019

Some contributions regarding the cultural evolution in the mountainous and hilly area of Oltenia (Romania) during the final eneolithic-incipient early bronze age period. In: Sîrbu, V. – Comșa, A. – Hortopan, D. (eds.): *Digging in the Past of Old Europe: Studies in honor of Cristian Schuster at his 60th anniversary*. Brăila 2019, 413–422.

WENINGER, B. 1995

Stratified 14C dates and ceramic chronologies: Case studies for the Early Bronze Age at Troy (Turkey) and Ezero (Bulgaria). *Radiocarbon* 37/2 (1995) 443–456.

WILD, J. P. 2008

Textile production. In: Oleson, J. P. (ed.): *The Oxford Handbook of Engineering and Technology in the Classical World*. Oxford 2008, 467–482.

WŁODARCZAK, P. 2006

Kultura ceramiki sznurowej na Wyżynie Małopolskiej. Kraków 2006.

Foreign-local interactions during the Early Bronze Age in the valley of Tundzha River and the new ways of presenting prestige

TODOR VALCHEV

Abstract

The first half of the 3rd millennium BC was one of the most dynamic and interesting periods in Balkan history. This is the time of migration of people, transfer of technological know-how, exchange of ideas and innovations, and cultural influence. During this time, in the valley of the Tundzha River, the migrating communities of the Yamnaya culture came into contact with the local population – the communities of the Ezero culture. The aim of this paper is to present the new ways of representing the prestige in prehistoric society during the Early Bronze Age. During this period, personal skills were very important and supported accumulation of authority and prestige. Prestige was also marked by the purchase and use of special objects (like weapons and personal adornments). During the Early Bronze Age, the local population in the valley of the Tundzha River adopted and developed innovations – new ways to present prestige by the communities of Yamnaya culture. Some of them are burial mounds – a new, different way of treating the dead and worshiping venerated relatives and ancestors; spiral hair rings made of silver that were worn by children and adults on the most visible area of the human body – the face; and bronze daggers – which have played an important role in the ideals of masculinity and heroism.

Key words: Yamnaya culture, prestige, burial mound, spiral hair ring, dagger

Introduction

In the second half of the 4th millennium BC in the Balkan Peninsula, a new age began. This period of development is characterized by the emergence of a new technology – the smelting of bronze¹. This new material enabled the prehistoric smiths to make different types of tools and weapons. In addition, they were able to copy any object, including imported ones, and to give them individual characteristics. As a rule, cast and forged bronze objects are unique products. For nearly 2500 years this new technology has dominated and shaped Eurasia and the Mediterranean Sea.

Aside the introduction of bronze smelting, Bronze Age is also known as a period of intensive movement and migration. People traveled between distant areas and exchanged their productions, ideas, innovations, and beliefs. At the same time, new ways for presenting prestige spread. As I will show in this paper, the purchase and use of special objects (such as weapons and personal adornments) is present also in the archaeological record. This indicates that personal skills played a significant role in the accumulation of authority and prestige.

Aside bronze technology, human migrations and evidence of long-distance exchange networks, Early Bronze Age is also marked by a complex social hierarchy. At this time, new prestige symbols such as burial mounds, silver hair rings, and bronze daggers were used. These innovations originated in the North Black Sea and Caucasian areas and spread across vast areas in Europe. During the migration of

¹ Bronze is an alloy of copper (Cu) and arsenic (As) or copper (Cu) and tin (Sn).

the communities of the Yamnaya culture, the new prestige symbols reach the valley of Tundzha River, where they have been accepted, adopted, and further developed by the local population.

The migrations in the 4th – 3rd millennia BC

The history of human society is the history of movement and contact. There are migrations in which thousands of people travel for decades in search for the optimal condition of life and a new homeland. However, incoming people do not enter completely empty, uninhabited areas, and accordingly, the relationships between “local” and “foreign” people have varied from violence to cooperation. At the end of the 5th millennium BC and during the first half of the 4th millennium BC, contact between the North Black Sea area and the Balkan Peninsula was sporadic. During this period, zoomorphic stone scepters and pottery made of clay mixed with clam shells appeared in the latter region. These finds have Eurasian steppes origin and are an indication of connection – peaceful or aggressive – between local farming communities in the Balkans and stockbreeding groups coming from the North Black Sea area (SLAVCHEV 2003; IVANOVA 2003, 157; GEORGIEVA 2005, 144–146, 155; HEYD 2011, 545; GEORGIEVA 2018, 99–102; PREDA-BĂLĂNICĂ – FRÎNCULEASA – HEYD 2020, 91; PREDA-BĂLĂNICĂ 2021, 144–145). According to P. GEORGIEVA (2005, 155), nomadic groups slowly moved in the southwest direction and infiltrated local communities.

Later, around 3100 BC, larger groups of migrants from the Yamnaya culture (also known as the Pit Grave culture or the Ochre Grave culture) appeared in the Balkan Peninsula. These people were also nomads who originally lived in the North Black Sea area. Many scholars believe that climatic changes in the 4th millennium BC, a further dry-out of the steppes, have forced people and their livestock to travel further to the west, to the Hungarian plain (PANAYOTOV 1989, 55; NIKOLOV 2006, 145; HEYD 2011, 549; FRÎNCULEASA – PREDA – HEYD 2015, 84; KAISER – WINGER 2015, 129–130; PREDA-BĂLĂNICĂ 2021, 147).

The Yamnaya culture is known only from its burial traditions. Typical is inhumation, either as primary individual graves under burial mounds or as secondary single graves dug in already existing mounds. In general, the grave pits are rectangular (rarely oval) in shape, dug into the virgin soil or into a mound, and sometimes accompanied by internal steps leading to the proper burial chambers. The bottom of the pit is often covered with organic mats or tree barks. The deceased, usually an adult male, is buried on the back, in supine position, with legs bent in the knees. The main orientation of both the pit and the dead is in east-west direction, with the head usually to the west. The dead person is sprinkled profusely with red ochre, usually locating in the head, feet and wrists regions of the body. Ceramic vessels, ochre pieces, bronze or copper tools, and weapons are sometimes included as grave gifts. Spiral hair rings, interpreted as hair decorations made from copper, gold or silver wire, are found near the skulls in some of the graves, while the grave pits themselves were covered with timber beams. Another relatively common element of grave assemblages is animal bones and teeth as part of the meat offering either to the dead person, and therefore found in or next to the grave pit, or as a part of the meals consumed around the ceremonies of the burial. A round earthen mound was erected over the grave. In cases when the graves are dug in already existing mounds, they are often accompanied with further mound heightening (PANAYOTOV 1989, 45–47; HEYD 2011, 539–541; LESHTAKOV 2011, 565; ALEXANDROV 2015, 37–39; AGRE 2015, 149; FRÎNCULEASA – PREDA – HEYD 2015, 47, 83; PREDA 2015, 9, 34; ALEXANDROV – KAISER 2016, 359–360; ILIEV 2011, 391–396; KAISER – WINGER 2015, 117; HEYD 2019, 125; VALCHEV – BLAZHESKA 2019, 242; PREDA-BĂLĂNICĂ – FRÎNCULEASA – HEYD 2020, 87, 97; PREDA-BĂLĂNICĂ 2021, 152–155; WŁODARCZAK 2021, 11).

Typical burial mounds of the Yamnaya culture were erected in northern Bulgaria for at least 500 years (starting in the last centuries of the 4th millennium BC and continuing during the first half of the 3rd millennium BC). It seems that the characteristic features of these burials did not change during this time span, which indicates that not just a single migration was involved. It must have been that several waves of population groups left the North Black Sea region and moved in a western direction. According to V. HEYD (2011; 2019), the Yamnaya population neither conquered their way from the Danube and Prut into the Carpathian Basin and Balkan Peninsula nor was their arrival a traumatic event. The incoming people did not enter a completely empty, unpopulated space in the regions west of the Black Sea. The farming societies in this area have been accustomed to dealing and interacting with different people and ethnic strangers for a long time (PANAYOTOV 1989, 49; IVANOVA 2003, 157; ILIEV 2011, 396; ALEXANDROV 2015, 43; KAISER – WINGER 2015, 127, 130–132; ALEXANDROV – KAISER 2016, 363, 367–368; ALEXANDROV 2018, 90–91; PREDA-BĂLĂNICĂ – FRÎNCULEASA – HEYD 2020, 97; PREDA-BĂLĂNICĂ 2021, 156–157; WŁODARCZAK 2021, 11).

Yamnaya culture in the valley of the Tundzha River

At the end of the 4th millennium BC, communities of the Yamnaya culture crossed the Stara planina Mountain and reached the valley of the Tundzha River. The Tundzha River passes through southeast Bulgaria. It is one of the largest rivers in the Upper Thracian plain, with a total length of 350 km and a 7884 sq. km watershed. The terrain in the river is level to hilly. The upper and middle courses of the Tundzha River pass between the Stara planina and Sredna gora mountains. It has a direct connection with the mountain passages. The Tundzha River is a left tributary of the Maritsa River. The last reaches the northern coast of the Aegean Sea (VARBANOV 2002, 184).

The climate in the area is transitional between Mediterranean and Continental. Currently, it is characterised by relatively warm winters, mild humidity, and hot summers. The maximum rainfall is observed twice a year in July and November, with the minimum rainfall occurring in both August and February (VELEV 2002, 156). The Tundzha River valley is dominated by smolnitsas and alluvial-meadow soils. The presence of clay watertight layers under hummus allows the soil to maintain a high level of water retention. The capacity of these soils to absorb and retain nutrients, together with their low density and glutinosity, determine their fertility (NINOV 2002, 304).

During the Bronze Age, the Tundzha River valley represented a peculiar passage that connects the Aegean coast with the lands north of the Stara planina Mountain and the Danube River Basin. The Balkan Peninsula is a natural crossroads of cultural influences from the Mediterranean Sea, Central Europe and South Russian steppes. The hilly landscape in the valley of the Tundzha River offered optimal natural conditions for the newcomers – Yamnaya people. They came into contact with the local population – the communities of Ezero culture² (PANAYOTOV 1989, 50–51; ILIEV 2011, 395–396; HEYD 2011, 542; KAISER – WINGER 2015, 136). Archaeological excavations in the valley of the Tundzha River show a relatively peaceful contact between the two groups. One must always keep in mind that the relationships between “local” and “foreign” people are complicated and varied from violence to cooperation. They are not always peaceful, but they are always two-way – each group adopts innovations from its neighbours and develops them according to its own style.

² LESHTAKOV (2011) rejects the existence of the Yamnaya culture in Thrace. During the Early Bronze Age, flat extramural burials with inhumations, intramural burials with inhumations, barrows with inhumations, cremation and bi-ritual burials – traditions that continued in the Late Bronze Age – all existed in the Upper Thracian plain. Thus, according to LESHTAKOV (2011, 561, 563, 568–569), the different cultures of the 3rd millennium BC cannot be separated according their funerary traditions.

Prestige in Bronze Age society

In Prehistory, the development of social complexity led to the separation of different social groups and the appearance of the first leaders – chiefs, priests, and warriors. In this period, personal skills were very important and supported accumulation of authority and prestige. Prestige is also marked by the purchase and use of special objects (such as weapons and personal adornments). Special objects had the following characteristics: they were made from rare, non-local, or valued raw material; had a faraway origin; were made by skilled craftsmen; and had a unique form. The accumulation of special objects displayed wealth, success, and power in a prehistoric society (NIKOLOV 2006, 79–80, 139–142; BĂJENARU 2010, 151; HANSEN 2013, 138, 159; HARDING 2015, 113–114; PREDA 2015, 12, 35). During the Bronze Age, new ways to present prestige appeared and developed. These innovations originally came from the North Black Sea areas, and during the migration of people, especially the communities of the Yamnaya culture, spread across vast areas in Europe.

The first innovation is the tradition of erecting burial mounds (*Fig. 1*). Burial mounds (also called tumuli, barrows, or kurgans) are conical earthen constructions that range from 0.5 m to 10 m in height and up to 60 m diameter. These impressive monuments represent a new and different way of treating the dead. They were monuments for remembering and worshiping venerated relatives and ancestors. Once constructed they become *lieux de mémoire*. The time and efforts put into the erection of burial mounds represented the prestige and privileges of the buried persons during their lifetimes (HARDING 2011, 22, 26, 28; HEYD 2011, 540, 546; BOURGEOIS 2013, 5–7, 11–12, 200; HANSEN 2013, 159; ALEXANDROV 2015, 43–44; FRÎNCULEASA – PREDA – HEYD 2015, 47, 85; KAISER – WINGER 2015, 132; PREDA 2015,



Fig. 1. An Early Bronze Age burial mound near Mogila village

8–9; ALEXANDROV – KAISER 2016, 359; HEYD 2019, 125; PREDA-BĂLĂNICĂ – FRÎNCULEASA – HEYD 2020, 87; PREDA-BĂLĂNICĂ 2021, 151).

In fact, one of the earliest graves under a burial mound in the Upper Thracian plain was found during the archaeological excavation of *Gonova mogila* near Targovishte, Stara Zagora district. In grave 1, the dead person was buried on the back in supine position with flexed legs. The grave had a southeast-northwest orientation, and the body of the deceased was covered with red ochre. The grave inventory included a 17.4 cm long obsidian blade and large numbers of copper and shell beads. Grave 1 is dated to the end of Bodrogkeresztúr culture in eastern Hungary and indicates steppe connections (PANAYOTOV 1989, 49; KANCHEV 1991, 45–46, 56–57; HEYD 2011, 543; KAISER – WINGER 2015, 130; ALEXANDROV – KAISER 2016, 366; PREDA-BĂLĂNICĂ 2021, 144). However, it is only during the first half of the 3rd millennium BC that a real wave of burial mounds construction could be observed in the valley of the Tundzha River. They are located, with only few exceptions, in the hilly regions east of Sazlijka River up to the Black Sea coast (HEYD 2011, 546; ALEXANDROV 2015, 38; KAISER – WINGER 2015, 132; ALEXANDROV – KAISER 2016, 362, 365). In the valley of the Tundzha River, this mortuary tradition continued until the beginning of 4th century AD, when Christianity became the main religion in the Roman Empire, and the erection of burial mounds began to be considered a pagan tradition³ (BAKARDZHIEV – VALCHEV – ILIEV 2018).

The second innovation is spiral hair rings. The spiral hair rings were made of copper, silver, and gold, and they could have from one up to three coils. Both children and adults wore these decorations in the most visible area of the human body, the face (*Fig. 2*)⁴. Silver spiral hair rings with one, one and a half, or two coils relate to jewellery traditions in the North Black Sea areas. The native form of the silver is rare in nature, which makes it even more precious to prehistoric people. Knowledge of silver processing

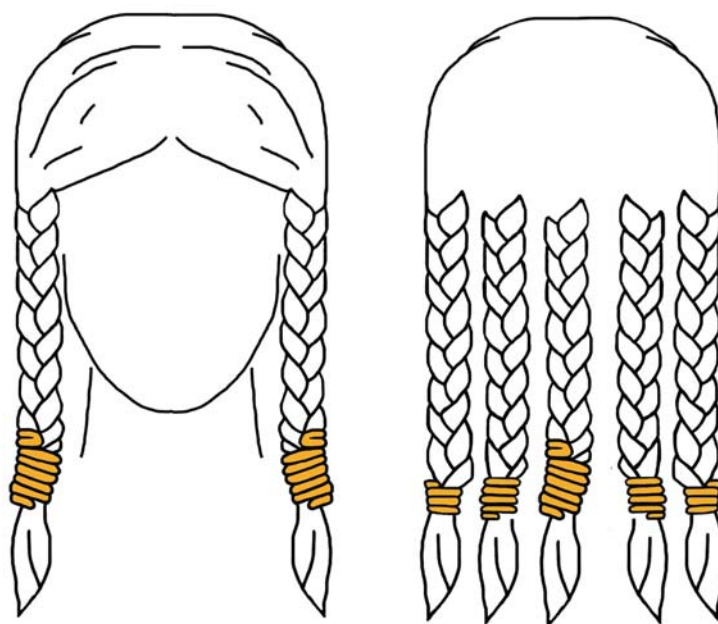


Fig. 2. A reconstruction of a hairstyle decorated with spiral hair rings (after VASILEVA 2021, Table IV:16)

³ There are more than 1200 burial mounds in the Yambol district. To date, 88 burial mounds have been excavated, and only 11 of them date to the Early Bronze Age (VALCHEV 2018; VALCHEV – SOBOTKOVA 2019).

⁴ Various positions of spiral hair rings are shown in *Worn to Impress. Development and Significance of the Metal Spiral Hair Ornaments in Early Bronze Age – Upper Thrace* by Z. Vasileva (VASILEVA 2021, T. IV.16).

is uncommon in the Balkan Peninsula. Accordingly, this jewellery technology probably comes in this area from the North Caucasus, where deposits of different metals exist. In addition to their aesthetic beauty, these decorations also presented social differentiation and represented the position of their owner in the community – inherited or acquired. This was perhaps the reason that personal possessions, such as hair rings, were used to dress the dead (PANAYOTOV 1989, 36, 47; IVANOVA 2003, 162–163; HEYD 2011, 540; FRÎNCULEASA – PREDA – HEYD 2015, 71; KAISER – WINGER 2015, 136; PREDA 2015, 18–19, 22; VASILEVA 2016, 227–228; ALEXANDROV 2017, 219, 224; VASILEVA – MINKOV 2018, 99; VALCHEV – BLAZHESKA 2019, 242; PREDA-BĂLĂNICĂ – FRÎNCULEASA – HEYD 2020, 97; VASILEVA 2021, 218–219).

From the valley of the Tundzha River, 30 silver spiral hair rings are known (Figs. 3 and 4). One spiral hair ring with one coil, and another one with one and a half coils, were found in grave 13 from burial mound 1⁵, locating near Boyanovo village, Yambol district (ILIEV 2011, 384; VALCHEV – BLAZHESKA 2019, 240, Fig. 2: 14, 15; ILIEV – BAKĀRDŽIEV 2020, Taf. 51/2-3; VASILEVA 2021, 223). In addition, one spiral hair ring with one and a half coils was found in grave 14, two spiral hair rings with one and a half coils were found in grave 16, and two spiral hair rings with one and a half coils were found in grave 18 excavated from the burial mound *Lozyanskata mogila* near Boyanovo village, Yambol district (ILIEV 2011, 386–388; AGRE 2015, 161–169, Fig. 31, Fig. 32, Fig. 34, Fig. 35, Fig. 39; VALCHEV – BLAZHESKA 2019, 239; VASILEVA 2021, 221–222, T. II.6). Further six spiral hair rings with one coil were found in grave 5 (also known as inhumation grave 3) excavated from a burial mound near Drazhevo village, Yambol district (VALCHEV – BLAZHESKA 2019, 238, Fig. 2: 6–11; ILIEV – BAKĀRDŽIEV 2020, Taf. 27/1–6, Taf. 28/1–6), while two spiral hair rings with one and a half coils were found in grave 30 from the burial mound *Gabrova mogila* near Kamen village, Sliven district (DIMITROVA 2014, 69–71; VALCHEV – BLAZHESKA 2019, 241; DIMITROVA 2021, 199; VASILEVA 2021, 220, T. IV.9). Four spiral hair rings with one and a half coils were found in grave 5, two spiral hair rings with one and a half coils were found in grave 7, and one spiral hair ring with one and a half coils was found in grave 9, all of them from the burial mound *Shekerdzha mogila* near Kamen village, Sliven district (DIMITROVA 2014, 76–78; VALCHEV – BLAZHESKA 2019, 241; VASILEVA 2021, 220–221). Moreover, two spiral hair rings with one and a half coils were found in grave 17 excavated from the burial mound near Malomirovo village, Yambol district (ALEXANDROV *et al.* 2022a), and three spiral hair rings with one and a half coils were found in grave 29 from the burial mound in *Golemia Kajryak* near Mogila village, Yambol district (VALCHEV – BLAZHESKA 2019, 237, Fig. 2: 1, 2, 4; ILIEV – BAKĀRDŽIEV 2020, Taf. 9/2–4; VASILEVA 2021, 221, T. II.1).⁶ Furthermore, two spiral hair rings with one and a half coils were found in grave 14 from the burial mound in *Malkia Kajryak* near Mogila village (ALEXANDROV *et al.* 2022b)⁷, while two spiral hair rings with one and a half coils were found in grave 1 from the burial mound near Straldzha town, Yambol district (ALEXANDROV 2017, 215, Fig. I/2–3, Fig. VI/1, 2; VALCHEV – BLAZHESKA 2019, 242; Vasileva 2021, 221, T. II.2). Finally, one spiral hair ring with one and a half coils was found in grave 4 and one spiral hair ring with two coils in grave 5 from the burial mound near Zimnitsa village, Yambol district (ILIEV 2011, 390; VALCHEV – BLAZHESKA 2019, 240, Fig. 2: 12, 13).

In the middle of the 3rd millennium BC, rich gold deposits in the southeastern part of the Balkan Peninsula were rediscovered and once again attracted the attention of the local smiths (DIMITROV – STOYCHEV 2018, 48–49). Precious metals have a special place in human history and the scale of values in European prehistory. It is a symbol of the life-dispensing sun, light, purity, fertility, and success. In

⁵ The burial mound is known under this name in the Bulgarian literature.

⁶ In this grave a hair ring of the Zimnicea type was also found (VALCHEV – BLAZHESKA 2019, 237, Fig. 2: 3; ILIEV – BAKĀRDŽIEV 2020, Taf. 9/1; VASILEVA 2021, 221).

⁷ Two hair rings of the Zimnicea type and one silver plate-decoration were also found from this grave (ALEXANDROV *et al.* 2022b).



Fig. 3. Silver and gold spiral hair rings from the valley of Tundzha River (after VALCHEV – BLAZHESKA 2019, Fig. 2)



Fig. 4. Map of burial mounds with hair rings

addition, its ability to resist corrosion makes it “divine metal” (PERNICKA 2018, 215; ARMBRUSTER 2013, 454, 461; HARDING 2015, 114).

During this time, the first gold spiral hair rings appeared in the valley of the Tundzha River. A spiral hair ring with two coils was found in grave 30 from a burial mound near Popovo village, Yambol district (VALCHEV – BLAZHESKA 2019, 238, Fig. 2: 5), while two spiral hair rings with one and a half and three coils were found in grave 3 excavated from a burial mound near Venets village, Burgas district (GEORGIEVA – NIKOV – HRISTOVA 2018, 329, Fig. 2; VALCHEV – BLAZHESKA 2019, 238; VASILEVA 2021, 223, T. IV.10–11). In addition, two spiral hair rings with two and a half and three coils were thrown out by treasure-hunters from the burial mound near Malomirovo village, Yambol district (VASILEVA 2021,

221, T. IV.12). Finally, one spiral hair-ring with one and a half coils was found in grave 4 from the burial mound *Shekerdzha mogila* near Kamen village, Sliven district (DIMITROVA 2014, 79–80, Fig. 10: 2). The golden spiral hair rings show the local development of this jewellery in the valley of the Tundzha River.

The last innovation is the dagger. A dagger is a weapon that is sharpened at both sides and has a maximum length of 30 cm. The knife (any object with one sharp edge) is well known in the Balkan Peninsula, but the dagger is an innovation. With sharpened edges, it can inflict severe cuts and slashes. It is a weapon for hand-to-hand fight and harms other people.

Some of the earliest flat tanged daggers in the valley of the Tundzha River were found during the archaeological excavation of the burial mound *Gabrova mogila* near Kamen village, Sliven district. One dagger was found near the cremated human bones in grave 28.⁸ It had a leaf-like form with a trapezoidal tang. It is 5.35 cm long and 1.95 cm wide (DIMITROVA 2014, 75; DIMITROVA 2021, 194). Two more daggers were found in grave 30 near skeletons 2⁹ and 3¹⁰. They have an elongated triangular form with a trapezoidal tang. The first one is 14.2 cm long and 3.4 cm wide. The second one is 12.9 cm long and 2.9 cm wide (DIMITROVA 2014, 71, Fig. 5: 2, 3; DIMITROVA 2021, 198–199). During excavation of the burial mound near Drazhevo village, Yambol district, a similar dagger was found. It was put as a grave good in grave 5¹¹ (also known as inhumation grave 3). The dagger has an elongated leaf-like form, with a triangular tang with traces of wooden handle. It is 10 cm long and 2.4 cm wide (Fig. 5) (ILIEV – BAKĀRDŽIEV 2020, Tafl. 27/7, Taf. 28/7).

Daggers appeared during the Bronze Age and spread across all areas of Europe and the Mediterranean Sea. According to N. SKAK-NIELSEN (2009, 351–352), they have been used during animal sacrifices and as a prestigious object to demonstrate the owner's high status and wealth in livestock. The analysis of 10 daggers from a site near Pragatto, Italy, showed that they have been used to process animal carcasses¹², including cutting bones, tendons, and muscles. The daggers have been repeatedly sharpened, denoting a preoccupation with keeping them sharp throughout their use life (CARICOLA *et al.* 2022, 2, 5).



Fig. 5. Bronze dagger from grave 5 from burial mound near Drazhevo village

⁸ The grave goods included also bone amulet or pin (DIMITROVA 2014, 75; DIMITROVA 2021, 194).

⁹ The grave goods included also a ceramic *askos* with incised decoration and amulet of boar tusk (DIMITROVA 2014, 70–71; DIMITROVA 2021, 198; VASILEVA 2021, 220).

¹⁰ The grave goods included also a ceramic *askos* with incised decoration, two silver spiral hair rings with one and a half coils, a bronze adze, and a wild boar tusk amulet (DIMITROVA 2014, 71; DIMITROVA 2021, 198–199; VASILEVA 2021, 220).

¹¹ The grave goods included also four ceramic vessels, six silver hair rings with one coil, four silver round ornaments, two copper awls, a flint blade and a shell (ILIEV – BAKĀRDŽIEV 2020, 31).

¹² In my opinion, the traces found on the daggers can be from human carcasses, too.

According to S. HANSEN (2013, 151–152), daggers must have played an important role in the ideals of masculinity and heroism. In fact, during the Bronze Age, military components were considered as important, and the hunter from earliest ages transformed into a warrior, whose role was to engage in fights. Accordingly, new types of weapons for close combat like swords, rapiers, and spearheads appeared. With the development of warfare, daggers became a common type of weapon and a symbol of the warrior (IVANOVA 2003, 165; IVANOVA – TSIMIDANOV 2004; SKAK-NIELSEN 2009, 251; BĂJENARU 2010, 151, 155–156; HEYD 2011, 546; HARDING 2015, 115–116; PREDA 2015, 32; IVERSEN 2017, 368; CARICOLA *et al.* 2022, 5). According to S. IVANOVA and V. TSIMIDANOV (2004, 136–137) in the Bronze Age, and especially in communities of the Yamnaya culture, all capable men were carriers of military function, but the presence of weapons in the graves can be considered as a sign of certain military merits of the buried ones.

The daggers from the burial mounds near Drazhevo and Kamen villages have more symbolic than real functions. As personal objects, they indicate the individual's social status and acquired position in the Bronze Age society.

Conclusions

The end of the 4th millennium and the first half of the 3rd millennium BC was one of the most dynamic and interesting periods in Balkan history. This was a period of migration, of people's transfer of technological know-how, the exchange of ideas and innovations, cultural influences, and beliefs. During this time, new ways of presenting prestige, such as burial mounds, silver hair rings, and bronze daggers, were developed. These innovations reached the valley of the Tundzha River with nomadic people from the steppes, mainly the communities of Yamnaya culture, which spread from the Ural Mountains to the Hungarian Plain. The new prestige symbols were adopted and developed by the local population – probably their elite – because metal was not available for many people and not for everyone, and time and effort were put into the erection of a burial mound.

In the Early Bronze Age, personal skills were very important and supported the accumulation of authority and prestige, but the presence of children graves with silver hair rings in burial mounds indicates that an inherited social status already existed. The children were assigned the status of the social group to which they belonged by their origin and probably developed it during their active social life. The development of the military component in the Early Bronze Age society led to the formation of warriors who were engaged in fighting with other people and had a strict hierarchy. During this period, all men were carriers of military function, but few had reached the leading position for organising attacking or defensive operations and the honour to be buried with weapons.

During the Early Bronze Age, the complexity of the social hierarchy was manifested by burial rites. At least two social classes – born-free men and the elite with inherited status (priests, commanders-in-chief, or leaders/chiefs, who concentrated religious and military power) – existed. The last ones are carriers of social-prestige, which can be visible – represented by adornments and other special objects – and invisible – personal skills and authority in society. This is when the consolidation of power – economic, military, religious, and political – begins.

References

AGRE, D. 2015

Archaeological Investigation of the “Lozianska Mogila” Barrow Located near the Village of Boyanovo, Municipality of Elkhovo, in South-eastern Bulgaria. *Praehistorische Zeitschrift* 90/1–2 (2015) 141–171.

ALEXANDROV, S. 2015

Mogilni grobove ot rannata bronzova epoha v Trakia (55 godini po-kasno). *Arheologia* 1–2 (2015) 33–48.

ALEXANDROV, S. 2017

Ukrashenia ot blagorodni metali ot rannata bronzova epoha vav fonda na Natsionalnia arheologicheski institut s muzej – Sofia. In: Popov, H. – Tzvetkova, J. (eds): *ΚΡΑΤΙΣΤΟΣ Sbornik v chest na profesor Petar Delev*. Sofia 2017, 215–227.

ALEXANDROV, S. 2018

The Early and Middle Bronze Age in Bulgaria: Chronology, Periodization, Cultural Contacts and Precious Metal Finds. In: Alexandrov, S. – Dimitrova, Y. – Popov, H. – Horejs, B. – Chukalev, K. (eds.): *Gold & Bronze Metals, Technologies and Interregional Contacts in the Eastern Balkans during the Bronze Age*. Sofia 2018, 43–57.

ALEXANDROV, S. – KAISER, E. 2016

The Early Barrow Graves in West Pontic Area. Cultures? Migrations? Interactions? In: Nikolov, V. – Schier, W. (eds): *Der Schwarzmeerraum vom Neolithikum bis in die Früheisenzeit (6000 – 600 v. Chr.) Kulturelle Interferenzen in der zirkumpontischen Zone und Kontakte mit ihren Nachbargebieten*. Rahden/Westf. 2016, 359–370.

ALEXANDROV, S. – WŁODARCZAK, P. – BAKARDZHIEV, S. – VALCHEV, T. 2022a

Arheologicheski razkopki na nadgrobna mogila ot bronzovata epoha do s. Malomirovo, obshtina Elhovo, oblast Yambol. *Arheologicheski otkritia i razkopki prez 2021 g.* Sofia 2022, in press.

ALEXANDROV, S. – HEYD, V. – VALCHEV, T. – PREDA-BĂLĂNICĂ, B. – HRISTOVA, T. 2022b

Arheologicheski razkopki na nadgrobna mogila ot bronzovata epoha do s. Mogila, obshtina Tundzha, oblast Yambol. *Arheologicheski otkritia i razkopki prez 2021 g.* Sofia 2022, in press.

ARMBRUSTER, B. 2013

Gold and gold working of the Bronze Age. In: Fokkens, H. – Harding, A. (eds.): *The Oxford Handbook of the European Bronze Age*. Oxford 2013, 454–468.

BĂJENARU, R. 2010

Between Axe and Dagger: Early Bronze Age Weaponry in the Lower Danube Area. *Transylvanian Review*, vol. XIX, Supplement No. 5/1 (2010) 151–162.

BAKARDZHIEV, S. – VALCHEV, T. – ILIEV, I. 2018

Spasitelni arheologicheski prouchvania na selishte ot bronzovata i nekropol ot rimskata epoha (obekt № 10 po traseto na tranziten gazoprovod № 2 za Republika Turtsia) pri s. Palauzovo, obshtina Straldzha. *Arheologicheski otkritia i razkopki prez 2017 g.* Sofia 2018, 146–148.

BOURGEOIS, Q. P. J. 2013

Monuments on the Horizon The formation of the barrow landscape throughout the 3rd and 2nd millennium BC. Leiden 2013.

CARICOLA, I. – CHARLES, A. – TIRILLÒ, J. – CHARLTON, F. – BARTON, H. – BREGLIA, F. et al. 2022

Organic residue analysis reveals the function of bronze age metal daggers. *Nature* 12 (2022) 1–10.

DIMITROV, K. – STROYCHEV, R. 2018

The East Balkan Region as a Source of Precious Metals from Prehistory to the Roman Period. In: Alexandrov, S. – Dimitrova, Y. – Popov, H. – Horejs, B. – Chukalev, K. (eds.): *Gold & Bronze Metals, Technologies and Interregional Contacts in the Eastern Balkans during the Bronze Age*. Sofia 2018, 85–95.

DIMITROVA, D. 2014

Grobove ot bronzovata epoha pri Kamen, Slivensko. *Arheologia* 1–2 (2014) 69–82.

DIMITROVA, D. 2021

Grobove ot bronzovata epoha v Gabrova mogila. In: Dimitrova, D. (ed): *Sbornik v pamet na Rumen Katincharov*. Izvestia na natsionalnia arheologicheski institut XLVII. Sofia 2021, 191–202.

FRÎNCULEASA, A. – PREDA, B. – HEYD, V. 2015

Pit-Graves, Yamnaya and Kurgans along the Lower Danube: Disentangling IVth and IIIrd Millennium BC Burial Customs, Equipment and Chronology. *Praehistorische Zeitschrift* 90/1–2 (2015) 45–113.

GEORGIEVA, P. 2005

Za zoomorfnite skiptri i poslednite etapi na kasnoeneolitnite kulturi Varna, Kodzhadermen-Gumelnitsa-Karanovo VI i Krivodol-Salkutsa. In: Donkov, R. (ed.): *Stephanos Archaeologicos in honorem Professoris Ludmili Getov*. Studia Archaeologica Universitatis Serdicensis, Supplementum IV. Sofia 2005, 144–167.

GEORGIEVA, P. 2018

Possible approaches to tracking the fate of the population of the Varna, Kodjadermen-Gumelnița-Karanovo VI and Krivodol-Sălcuța cultures. In: Dietz, S. – Mavridis, F. – Tanković, Ž. – Takaoğlu, T. (eds.): *Communities in Transition: The Circum-Aegean Area during the 5th and 4th Millennia BC*. Oxford 2018, 95–106.

GEORGIEVA, R. – NIKOV, K. – HRISTOVA, R. 2018

Early Bronze Age Tumular Graves near Venets, Karnobat Region. In: Alexandrov, S. – Dimitrova, Y. – Popov, H. – Horejs, B. – Chukalev, K. (eds.): *Gold & Bronze Metals, Technologies and Interregional Contacts in the Eastern Balkans during the Bronze Age*. Sofia 2018, 328–329.

HANSEN, S. 2013

Innovative Metals: Copper, Gold and Silver in the Black Sea Region and the Carpathian Basin during the 5th and 4th Millennium BC. In: Burmeister, S. – Hansen, S. – Kunst, M. – Müller-Scheeßel, N. (eds.): *Metal Matters Innovative Technologies and Social Change in Prehistory and Antiquity*. Rahden/Westf. 2013, 137–167.

HARDING, A. 2011

The tumuls in European Prehistory covering the body, housing the soil. In: Borgna, E. – Müller-Celka, S. (eds.): *Ancestral Landscapes Burial mounds in the Copper and Bronze Ages (Central and Eastern Europe – Balkans – Adriatic – Aegean, 4th – 2nd millennium B.C.)*. Travaux de la Maison de l'Orient et de la Méditerranée 58. Lyon 2011, 21–30.

HARDING, A. 2015

The emergency of elite identities in Bronze Age Europe. *ORIGINI* XXXVII (2015) 111–121.

HEYD, V. 2011

Yamnaya groups and tumuli west of the Black Sea. In: Borgna, E. – Müller-Celka, S. (eds.): *Ancestral Landscapes Burial mounds in the Copper and Bronze Ages (Central and Eastern Europe – Balkans – Adriatic – Aegean, 4th – 2nd millennium B.C.)*. Maison de l'Orient et de la Méditerranée 58. Lyon 2011, 535–555.

HEYD, V. 2019

Yamnaya – Corded Wares – Bell Beakers, or how to conceptualize events of 5000 years ago that shaped modern Europe. In: Valchev, T. (ed.): *Studia in honorem Iliae Iliev. A jubilee collection dedicated to the 70th anniversary of Ilia Iliev*. Bulletin of Regional Historical Museum in Yambol vol 9. Yambol 2019, 123–134.

ILIEV, I. 2011

The Pit Grave culture in the lower Tundzha valley. *Studia Praehistorica* 14 (2011) 381–398.

ILIEV, I. – BAKĀRDŽIEV, S. 2020

Kurgane der Frühen bis Späten Bronzezeit im Bezirk Jambol, Südostbulgarien. The Yamnaya Impact on Prehistoric Europe 1. Budapest 2020.

IVANOVA, S. 2003

The Social Differentiation in the Pit-Grave Culture Society: A reconstruction Based on Burial Data. In: Nikolova, L. (ed.): *Early Systems for Communication in Southeast Europe*. Oxford 2003, 157–167.

IVANOVA, S. – TSIMIDANOV, V. 2004

Voinstvo v yamom obshtestve Severo-Zapadnogo Prichernomoriya. *Drevnosti* (2004) 133–140.

IVERSEN, R. 2017

Big-Men and Small Chiefs: The Creation of Bronze Age Societies. *Open Archaeology* 3 (2017) 361–375.

KAISER, E. – WINGER, K. 2015

Pit graves in Bulgaria and the Yamnaya Culture. *Praehistorische Zeitschrift* 90/1–2 (2015) 114–140.

KANCHEV, M. 1991

Nekropoli ot bronzovata epoha v rajona na Maritsa-Iztok. In: Panayotov, I. – Leshtakov, K. – Georgieva, R. – Alexandrov, S. – Borisov, B. (eds.): *Maritsa-Iztok. Arheologicheski prouchania*, vol. 1. Radnevo 1991, 41–70.

LESHTAKOV, K. 2011

Bronze Age mortuary practices in Thrace: a prelude to studying the long-term tradition. In: Borgna, E. – Müller-Celka, S. (eds.): *Ancestral Landscapes Burial mounds in the Copper and Bronze Ages (Central and Eastern Europe – Balkans – Adriatic – Aegean, 4th – 2nd millennium B.C.)*. Maison de l'Orient et de la Méditerranée 58. Lyon 2011, 561–571.

NIKOLOV, V. 2006

Kultura i izkustvo na praistoricheska Trakia. Plovdiv 2006.

NINOV, N. 2002

Pochveno-geografsko rajonirane. In: Kopralev, I. (ed.): *Geografia na Balgaria*. Sofia 2002, 300–312.

PANAYOTOV, I. 1989

Yamnata kultura v balgarskite zemi. Razkopki i prouchvania XXI. Sofia 1989.

PERNICKA, E. 2018

The Chemical Composition of the Gold Finds from Valchitran Treasure. In: Alexandrov, S. – Dimitrova, Y. – Popov, H. – Horejs, B. – Chukalev, K. (eds.): *Gold & Bronze Metals, Technologies and Interregional Contacts in the Eastern Balkans during the Bronze Age*. Sofia 2018, 215–222.

PREDA, B. 2015

Considerations regarding barrows burials and metal depositions during the Early Bronze Age in the Carpathian-Danube area. *Hiperboreea Journal* 2 (2015) 5–51.

PREDA-BĂLĂNICĂ, B. 2021

Still making waves. Marija Gimbutas in current archaeological debates. In: Heyd, V. – Kulcsár, G. – Preda-Bălănică, B. (eds.): *Yamnaya Interactions Proceedings of the International Workshop held in Helsinki, 25–26 April 2019*. The Yamnaya Impact on Prehistoric Europe 2. Budapest 2021, 137–170.

PREDA-BĂLĂNICĂ, B. – FRÎNCULEASA, A. – HEYD, V. 2020

The Yamnaya Impact North of the Lower Danube: A Tale of Newcomers and Locals. *Bulletin de la Société préhistorique française* 117/1 (2020) 85–101.

SKAK-NIELSEN, N. 2009

Flint and metal daggers in Scandinavia and other parts of Europe. A re-interpretation of their function in the Late Neolithic and Early Copper and Bronze Age. *Antiquity* 83 (2009) 349–358.

SLAVCHEV, V. 2003

Po vaprosa za migratsiata na stepnite plemena v kraya na V hil. pr. Hr. In: Lazarov, M. – Valkanov, V. (eds.): *Cherno more mezhdu Iztoka i Zapada. VII Pontijski cheteniya, Varna, 10–11 Maj 2002*. Varna 2003, 50–56.

VALCHEV, T. 2018

A history of archaeological research in the Yambol province. In: Ross, S. – Sobotkova, A. – Tzvetkova, J. – Nekhrizov, G. – Connor, S. (eds.): *The Tundzha Regional Archaeological Project. Surface Survey, Palaeoecology, and Associated Studies in Central and Southeast Bulgaria, 2009–2015 Final Report*. Oxford 2018, 126–133.

VALCHEV, T. – BLAZHESKA, Z. 2019

Silver and gold pendants from Early Bronze Age from Lower and Middle course of Tundzha River, Bulgaria. *ANODOS Studies of the Ancient World* 14 (2014 (2019)) 235–243.

VALCHEV, T. – SOBOTKOVA, A. 2019

Monitoring burial mounds in the Yambol province: deploying mobile technology to improve culture heritage protection. In: Kyriakidis, P. – Agapiou, A. – Lysandrou, V. (eds.): *Spreading Excellence in Computer Applications for Archaeology and Cultural Heritage Proceeding of the 3rd CAA-GR Conference 18–20 June 2018, Limassol, Cyprus*. Limassol-Cyprus 2019, 19–23.

VARBANOV, M. 2002

Hidrografska karakteristika. In: Kopralev, I. (ed.): *Geografia na Balgaria*. Sofia 2002, 183–187.

VASILEVA, Z. 2016

Yuvelirni tsentrove ot rannata bronzova epoha v Egea i Trakia. *Studia Archaeologica Universitatis Serdicensis* 5 (2015 (2016)) 219–238.

VASILEVA, Z. 2021.

Worn to Impress. Development and Significance of the Metal Spiral Hair Ornaments in Early Bronze Age – Upper Thrace. In: Leshatkov, K. – Andonova, M. (eds.): *Galabovo in Southeast Europe and Beyond. Cultural Interactions during the 3rd-2nd Millennium BC*. Sofia 2021, 218–232.

VASILEVA, Z. – MINKOV, P. 2018

Cultural Influences and Long-Distance Contacts during the 3rd Millenium BC. In: Alexandrov, S. – Dimitrova, Y. – Popov, H. – Horejs, B. – Chukalev, K. (eds.): *Gold & Bronze Metals, Technologies and Interregional Contacts in the Eastern Balkans during the Bronze Age*. Sofia 2018, 97–103.

VELEV, S. 2002

Klimatichno rayonirane. In: Koprarev, I. (ed.): *Geografia na Balgaria*. Sofia 2002, 155–156.

WŁODARCZAK, P. 2021

Investigation of prehistoric barrows in Bačka. Introduction. In: Jarosz, P. – Koledin, J. – Włodarczak, P. (eds.): *Danubian Route of the Yamnaya Culture: The Barrows of Vojvodina*. The Yamnaya Impact on Prehistoric Europe, vol. 3. Budapest 2021, 9–27.

From West to East and East to West: Yamnaya Migration and Interaction with Copper Age/Early Bronze Age Carpathian Communities in Transylvania

HORIA I. CIUGUDEAN – COLIN P. QUINN – CLAES UHNÉR – JESS BECK

Abstract

The spread of Yamnaya migrants from the Eurasian Steppe towards Transylvania and the Carpathian Basin has been a major focus of archaeological research. The consequences of this migration, however, would have been more nuanced than traditionally envisioned. We present novel insights into the consequences of the Yamnaya migration through new analyses of the material culture, chronology, and funerary practices in southwest Transylvania. Within Transylvania and the Carpathian Basin, the introduction of Yamnaya ideas did not result in the full abandonment of Early Bronze Age traditions or the replacement of local populations with newcomers. Instead, local communities responded and shifted some practices, while maintaining a strong connection to their Copper Age ancestry through the reuse and repurposing of space. As in any dynamic social context, Yamnaya and their descendant communities adopted and moved objects and ideas from the west to the east and the Eurasian Steppe. In light of the data presented here, we argue that Transylvania during the Late Copper Age and Early Bronze Age was a dynamic context of migration, interaction, social change, and continuity.

Key words: Transylvania, Early Bronze Age, Coțofeni, Yamnaya, radiocarbon dates

Yamnaya, migration, and social change

Communities from the Eurasian steppe, called “the Yamnaya culture” by archaeologists, migrated into the Carpathian Basin during the Late Copper Age and Early Bronze Age (HEYD 2011; ANTHONY 2021). The Yamnaya are most strongly associated with large kurgans (burial mounds/tumuli) that remain a monumental presence on the landscape even today. Research into the western expansion of Yamnaya has mainly focused on the group of mounds distributed in the Lower Danube area: Bulgaria (KAISER – WINGER 2015), southern Romania (FRÎNCULEASA – PREDA – HEYD 2015; FRÎNCULEASA 2021), eastern Serbia (KOLEDIN *et al.* 2020) and the Tisza region (HORVÁTH *et al.* 2013; DANI 2020; DANI – KULCSÁR 2021). However, unlike the regions of the Lower Danube or Tisza rivers, the uplands of Transylvania continued to be dominated by local Early Bronze Age (EBA) groups throughout the beginning of the 3rd millennium BC (CIUGUDEAN 1996; 2011; PREDA-BĂLĂNICĂ – FRÎNCULEASA – HEYD 2020).

For multiple reasons, Yamnaya has caught the attention of many scholars of European prehistory. Recent ancient DNA (aDNA) research has demonstrated that people with ancestry in the Eurasian (Pontic-Caspian) steppe migrated west into Europe (ALLENTOFT *et al.* 2015; HAAK *et al.* 2015; MATHIESON *et al.* 2018). Picking up on aDNA and linguistic analysis, KRISTIENSEN *et al.* (2017) developed a model that credits Yamnaya expansion for precipitating social change and transformation leading to the emergence – perhaps in parallel – to other cultural identities such as Corded Ware. This work has a precedent, from the work by GIMBUTAS (1961) and in ANTHONY’s (2007) argument that horse-riding, wagon-driving, and

proto-Indo-European-speaking Yamnaya migrated west from the Eurasian steppe, and fundamentally transformed Europe forever (also see ANTHONY – RINGE 2015).

Many archaeologists are skeptical of narratives that centre migration as an explanation for social change – for good reason. FURHOLT (2021) notes that migration narratives often rely upon “archaeological culture” frameworks – the belief in culturally and biologically homogenous territorial groups – that were constructed in the 19th century as part of nationalistic, colonial, and racist endeavours to demonstrate superiority of certain peoples over others. Archaeological cultures were defined on the basis of a very narrow range of material signatures (e.g. Corded Ware Culture, Beaker Culture, Kurgan Culture). When material signatures changed, migration was pointed to as one of two possible explanations – along with diffusion – for why this change occurred. Implied in these models was a sense of conquest, superiority, and “survival of the fittest” concepts in social Darwinism that were dominant in intellectual circles of the late 19th century. When archaeologists began to reject these models of how societies are organised, they also threw out the preferred models of explaining social change – migration and diffusion – and replaced them with explanations for social change that are often endogenous to a society. For example, the emergence of agriculture did not have to be explained by waves of migrating farmers, but could also have emerged through independent episodes of domestication that fostered the growth and expansion of complex socioeconomic systems. After decades, explanations that centre migration are still seen in many quarters as outdated and inherently linked with concepts of racial superiority and colonialism (see FURHOLT 2021). With the advent of aDNA and the reemergence of migration as a causal mechanism in the study of social change in European prehistory, these issues have once again been brought to the forefront of archaeological discourse.

FRIEMAN and HOFMANN (2019) outline the consequences of this theoretical and methodological turn – especially on the narratives of population and cultures. Echoing BURMEISTER (2000; 2017), the authors call for archaeologists to build new theory and methods of understanding migration in the past by developing high-resolution chronologies, examining the dynamic role of material culture in how people construct identity, and to provide sophisticated explanations for how people behave in contexts of cultural interaction. Archaeologists, therefore, need to contextualise narratives of large-scale migration derived from aDNA into a social framework that acknowledges the complicated, and sometimes messy, ways that people interact with each other.

This perspective informs our approach to the Yamnaya expansion from the Eurasian steppe into the Carpathian Basin and Transylvania. As in any context of a population movement, there would be both continuities and discontinuities in social practices as locals and migrants navigated the dynamics of a new social landscape. Yamnaya communities would have been affected as they were exposed to different ideas held by the local communities into which they moved. Likewise, local communities would have adapted as well, sometimes adopting social practices brought in by immigrant communities. Adoption of social practices often includes some translation and modification – which will affect both migrant and local communities. We must also be careful not to overstate the scale of Yamnaya migration, especially in Transylvania (see GOGÂLTAN 2021; FRÎNCULEASA 2021). It is possible to have the introduction and diffusion of ideas associated with Yamnaya through an existing population without full-scale migration occurring.

As a result, looking for continuities and discontinuities across a broad range of social, economic, and ritual dimensions rather than focusing on one single line of evidence can help archaeologists better understand the nature of interaction among disparate communities. Unfortunately, as we note above, our understanding of Yamnaya in the Carpathian Basin is dominated by evidence from tumuli – and the insights they provide into mortuary rituals and archaeogenetics. In this paper, however, we examine

a variety of ways in which we can see the spread of Yamnaya not only as a mechanism for social and demographic change in Europe, but that also had ripple effects back towards the Eurasian steppe.

The heritage of Old Europe: the Coțofeni culture

Prior to the arrival of Yamnaya, Transylvania was occupied by people whom archaeologists have called the Coțofeni culture; part of a broader phenomenon called the Baden-Coțofeni horizon that extended into the Carpathian Basin and beyond (FURHOLT – SZMYT – ZASTAWNY 2008). We consider the Coțofeni culture as belonging to the Late Copper Age (also known as the Late Eneolithic Age) and its end marks the beginning of the Early Bronze Age (EBA) in the Transylvanian region (CIUGUDEAN 1996, 15–20, 139–148; 2021; GOGÂLTAN 2015, fig. 23; BECK – CIUGUDEAN – QUINN 2020). This view fits with the current Bronze Age chronology of Hungary (KULCSÁR – SZEVEÉNYI 2013; KISS *et al.* 2019), but it is still around 500 years older than the current central European chronology (BERTEMES – HEYD 2002; 2015).

The relative chronology of the Baden-Coțofeni is a source of disagreement in the literature. Some Romanian and Bulgarian scholars assign the Coțofeni culture to the EBA rather than the Copper Age (VULPE 1991; 2001; BĂJENARU 2010; 2014, 25–30; MOTZOI-CHICIDEANU 2011, 48–56; for Bulgaria see: VAJSOV 2002; ALEXANDROV 2018). However, there are several strong cultural historical reasons for assigning the Baden-Coțofeni cultural horizon to the Late Copper Age. First, the subsistence practices (agro-pastoralism) and funerary practices (cremation under tumuli or flat cemeteries) are closely connected to their predecessors from the Middle Copper Age, such as the Funnel Beaker, Scheibenhinkel or Lažňany cultures (SACHSSE 2008). Second, metallurgical traditions of the Baden-Coțofeni correspond with Late Copper or Late Eneolithic Age (LICHARDUS 1991; RACZKY 2009; HORVÁTH 2009; SCHIER 2014). The limited typology and paucity of copper objects, especially prior to the last Coțofeni phase (VULPE 1975; ROMAN 1976; CIUGUDEAN 2002), suggests a Copper Age association rather than an EBA affiliation (see BONDÁR 2019).

Absolute dating using radiocarbon dates and Bayesian modeling provides another way of determining the internal chronology of the Coțofeni culture and its relationship to other cultural horizons in the Carpathian Basin during the second half of the 4th millennium BC and start of the 3rd millennium BC. While archaeologists have dated Coțofeni sites in Romania for nearly three decades (CIUGUDEAN 1996, 58–59; 2000, 145–146; 2015, 168–169; BĂJENARU 1998, 6–10), the number of ¹⁴C dates has remained low until recently (DIACONESCU – TINCU 2016; DIACONESCU 2020, 28–32; FRÎNCULEASA 2020a, 47–50). Here we present the most complete picture of the absolute chronology of the Coțofeni culture in a broader central European context based on previously published and new samples from our work in the Apuseni Mountains and middle Mureș valley. This picture is the first one to cover the complete development of this culture, from the middle of the 4th millennium BC to the end of the first quarter of the 3rd millennium BC.

The earliest evidence of Coțofeni (phase Coțofeni I) comes from excavations in the Turdaș site,¹ where Coțofeni groups coexisted with Boleráz-Cernavoda III communities. Three samples belonging to the Coțofeni I horizon (RoAMS: 1466.117; RoAMS: 1468.117; and RoAMS: 1469.117) date to the second half of the 4th millennium cal BC (*Fig. 8*)². These results correspond perfectly with the dates of the early Baden (Boleráz) (WILD *et al.* 2001; HORVÁTH 2009, 107–108; SIKLÓSI 2009; BONDÁR 2015,

¹ The site we refer to here (Turdaș – Siteș) is not the famous Neolithic one (Turdaș – Luncă), which lies on the left bank of the Mureș river (LUCA 2012), but it is located on a gentle south-eastern oriented slope of a small stream, east of the village.

² For the calibration, the Oxcal v 4.4.4 software (BRONK RAMSEY 2021) was used. Atmospheric data from REIMER *et al.* 2020.

242–253). A bone sample (RoAMS: 1464.117) from a feature at the Turdaş site that has ceramics without early Coţofeni decoration patterns produced a calibrated date between 3706–3537 cal BC. Therefore, the proto-Boleráz occupation at Turdaş corresponds with most of the calibrated dates for this pre-Baden horizon in Hungary, Austria and Slovakia (HORVÁTH 2009, 104–107).

The second phase of the Coţofeni culture is defined by shifts in ceramic production (CIUGUDEAN 2000; CIUGUDEAN *et al.* 2005, 9–18; GOGÂLTAN – MOLNAR 2009), but still covers the whole area of Transylvania and Banat (CIUGUDEAN 2000), with a clear predilection for the lowlands. There are few dates for Coţofeni II and they place it somewhere between 3300–3100 cal BC (*Fig. 8*). The date from Peţelca Unit 1 Level I (OS-113603: 4560±20 BP), together with the one from Gligoreşti – Holoame, pit 9/1994 (4514 ±30 BP, according to FRÎNCULEASA 2020a, 48)³, corresponds with the time of post-Boleráz/classic Baden evolution (HORVÁTH 2009, 108–109). They both fall in the same period with part of the classical Baden graves from Budakalász (SIKLÓSI 2009, *fig. 16*) and Nagykanizsa–Billa (WILD *et al.* 2001). It should be noted that the only sample collected from an animal bone (Hd-29517: 4531±21 BP) in the lowest level of Trench IV at Poiana Ampoiului falls in the same period, which might indicate that the occupation of this Coţofeni site has started earlier than previously thought (CIUGUDEAN 2015, 168 and *fig. 1*).

While in the west and south, the expansion of Coţofeni groups reached eastern Serbia and north-western Bulgaria, the south-eastern corner of Transylvania seems to be somehow “abandoned” by the end of phase II, most probably before 3100 BC, according to the result of our Bayesian analysis (*Fig. 8*).

The change that took place in the evolution of the Coţofeni culture by the end of its second phase is quite spectacular, and is not restricted to the appearance of the *Fürchenstichkeramik* style. One major shift is the rapid expansion of the Coţofeni III settlements in the highlands of both western Transylvania and the Banat (CIUGUDEAN 2000). We consider this change as likely indicative of the increase in seasonal transhumance, accompanied by additional modifications in the subsistence strategies (BECKER 1999; CIUGUDEAN 2000, 19–21; BINDEA 2005).

Hăpria and Râmeţ: new perspectives on the Late Coţofeni-EBA transition

The transition from the late Coţofeni (Coţofeni III) to the EBA is a critical context in which the social consequences of the Yamnaya migration and the responses by local communities can be investigated. Two relevant and recently excavated sites, Hăpria and Râmeţ (*Fig. 1* and *Fig. 2*), are highly important for understanding the shift from the Coţofeni to the EBA and the role played by the Copper Age ancestry in this complex process. These sites support existing arguments for the persistence of a strong Coţofeni ancestry in the first EBA horizon (the Livezile group) of western Transylvania (CIUGUDEAN 1986; 1996).

The site of Hăpria, excavated in 2013⁴, is located in the north-western corner of the Secaşelor Plateau, ca. 4 km from the left bank of the Mureş river (*Fig. 2*), at an altitude of 434 m above sea level. It consisted of an earthen mound/tumulus, built over a habitation area belonging to the Coţofeni culture. The mound is 16 m in diameter and about 2 m high (*Fig. 3.1*), but the latter number does not reflect the actual height of the mound, as the central area includes the debris of a demolished Coţofeni house. The majority of the soil that made up the mound consisted of redeposited cultural deposits from the Coţofeni

³ Regarding the relative chronology of the Coţofeni occupation, we agree with the authors that its beginning should be placed in the IInd phase and the end somewhere in the early Coţofeni III phase (POPA – GOGÂLTAN 2014, 250–251). But we disagree that pit 9 is Coţofeni III; the ceramics found in the filling are typical for the second phase (POPA – GOGÂLTAN 2014, pl. 16–19), a fact confirmed by the ¹⁴C date.

⁴ The excavations were directed by Horia Ciugudean, together with Claes Uhnér, in the frame of a cooperation project between Eurasien Abteilung of DAI, Berlin and Muzeul Naţional al Unirii, Alba Iulia.

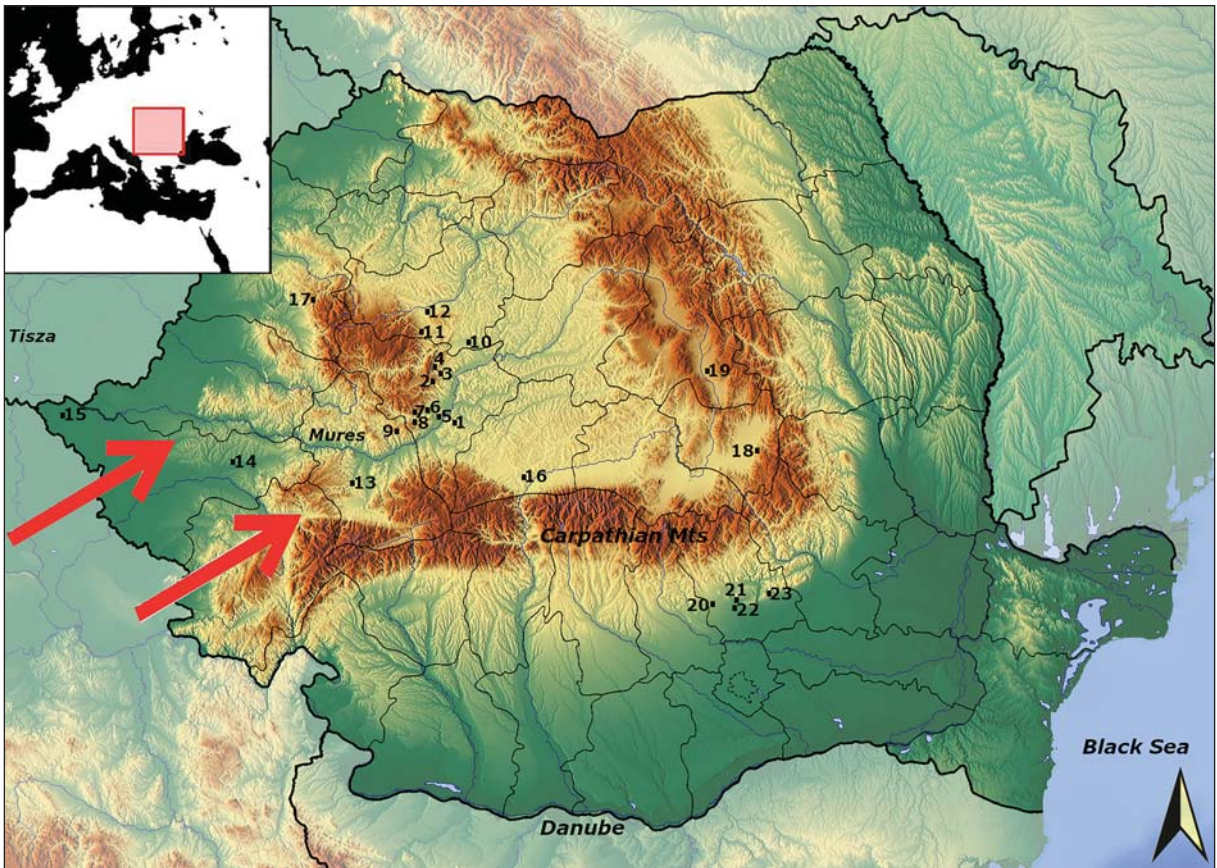


Fig. 1. Map of Romania with the location of selected EBA sites: 1. Hăpria, 2. Râmeț, 3. Livezile, 4. Cheile Aiudului, 5. Alba Iulia, 6. Ampoița, 7. Meteș, 8. Poiana Ampoiului, 9. Mada, 10. Câmpia Turzii, 11. Agriș, 12. Florești, 13. Silvașu de Jos, 14. Bodo, 15. Bucova Pusta, 16. Cașolț, 17. Izbucu Topliței, 18. Zăbala, 19. Jigodin, 20. Ariceștii-Rahivani, 21. Blejoi, 22. Ploiești, 23. Șoimești, (The red arrows indicates the direction of Yamnaya expansion towards Transylvania)

habitation at the site. The fill in the central part of the mound contained stones of varying sizes, and several stones were also found in the peripheral parts. There were also a few concentrations of limestone rocks, whose origin does not seem to be related to the geological background of the surrounding area (Fig. 3.3). However, none of these features were associated with the burials, so how and why they arrived at the site is yet unclear. An undisturbed clay hearth was found in the central part of the mound's NE quadrant (Fig. 3.4), and the mound's fill also contained large amounts of ceramics (Fig. 4) and animal bones, as well as a few lithic and bone tools. The shapes and decoration patterns are consistent with the Coțofeni III a–b subphases, and have good parallels in the feature 5/mound 1 and feature 2/mound 3 at Silvașu de Jos (LUCA *et al.* 2011; DIACONESCU – TÎNCU 2016).

Two animal bones have been dated from the Coțofeni occupation level at Hăpria, calculated at 4434 ± 26 BP/3326–2931 cal BC (95.4% probability) and 4385 ± 24 BP/3089–2917 cal BC (95.4% probability) (Fig. 5.1–2). The 2 sigma calibrated dates are similar to the ones at Silvașu de Jos (DIACONESCU – TÎNCU 2016; DIACONESCU 2020). They also correspond to the radiocarbon dates from the Prahova area south to the Carpathians, where Coțofeni III ceramics was also found in the mound IV and *Movila pe Răzoare* at Ariceștii-Rahivani (FRÎNCULEASA *et al.* 2014; FRÎNCULEASA 2020a).

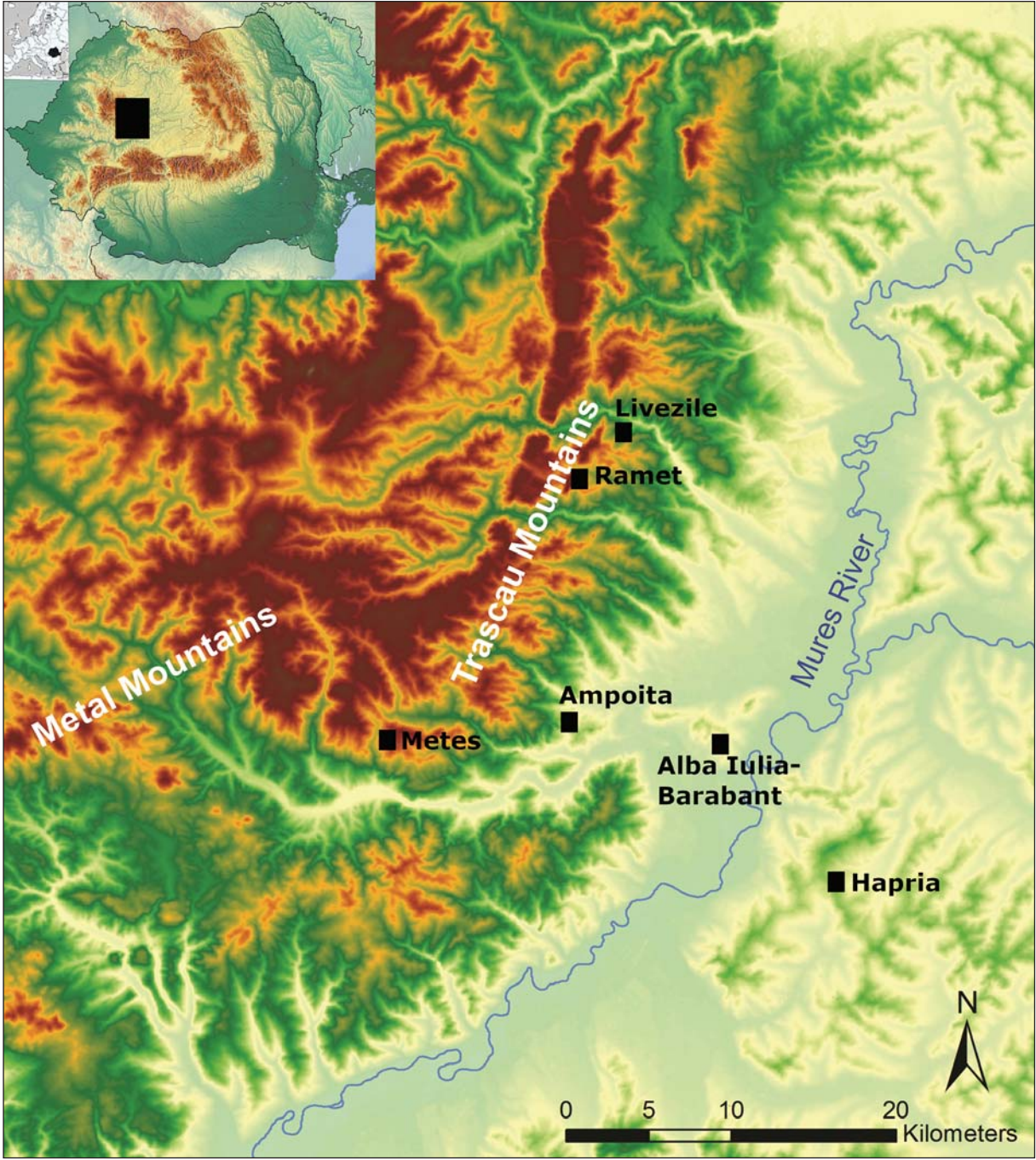


Fig. 2. EBA selected funerary sites in southwest Transylvania

Râmeț-Gugu is another Late Copper Coțofeni habitation site that was transformed into an Early Bronze Age cemetery. The site is located in the central area of the Trascău Mountains, part of the Apuseni Mountains (Fig. 1.2 and Fig. 2), at an altitude of 788 m (Fig. 7.7–8). The hilltop has a large view over the Mureș valley to the south (Fig. 7.2), and towards the Râmeț Gorge to the west (Fig. 7.1). The Coțofeni occupation was enclosed by two ditches that were approximately 70 m in diameter (Fig. 7.3). Each ditch was approximately 2 m wide and full of residential debris, the ceramics being largely included in the



Fig. 3. The tumulus from Hăpria: 1. General view of the mound before excavation; 2. Shell deposition; 3. Limestone rocks structure; 4. Clay hearth on the Coțofeni floorhouse; 5. Primary burial with the skeleton in frog-like position (ID 984); 6. Skull deposition (ID 644); 7. Commingled burial (ID 766–789) (Photos by Claes Uhnér)

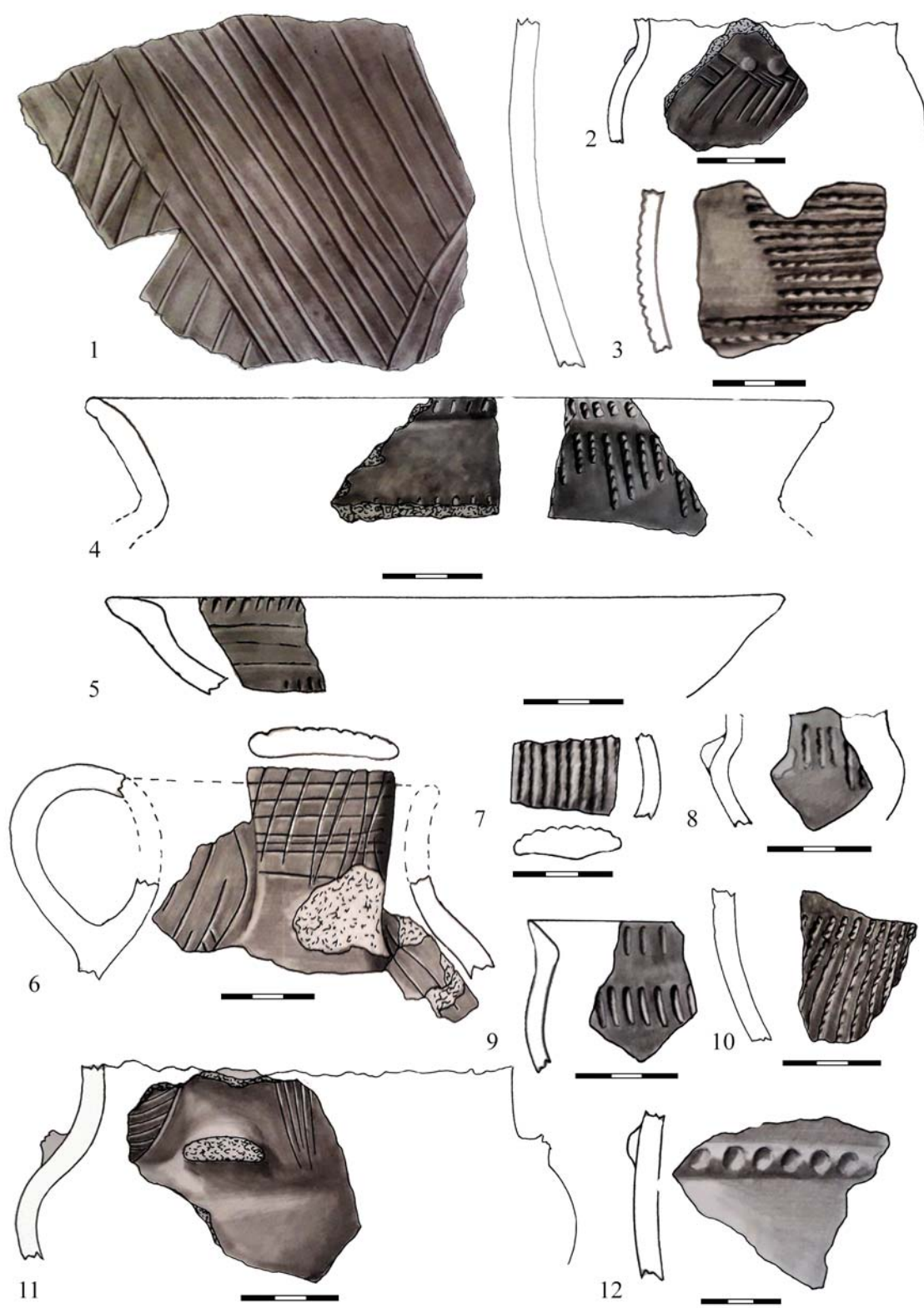


Fig. 4. Coșofeni III ceramics found in the fill of the tumulus at Hăpria

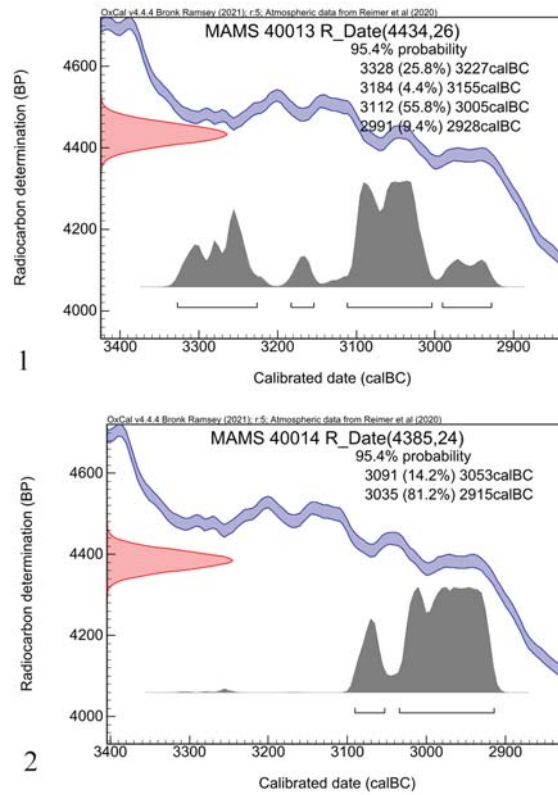


Fig. 5. Calibrated dates of animal bone samples from the Coțofeni deposition at Hăpria

Coțofeni III phase. Two samples (UGAMS-44054 and UGAMS 44056) have provided the radiocarbon dates of 4270 ± 30 BP and 4300 ± 25 BP respectively. Calibrated with 2 sigma, the dates fall within the time span of 2930–2790 cal BC and 2940–2880 cal BC (Fig. 8).

As one can easily see, the time period of the Coțofeni occupation both in Hăpria and Râmeț overlaps from the 29th to the 31st century BC. This period coincides with the one indicated by most of the calibrated radiocarbon dates related to the Coțofeni III phase in Transylvania and outside the Carpathians (DIAONESCU – TINCU 2016; DIAONESCU 2020; FRÎNCULEASA 2020a). It is true that part of the samples from the Coțofeni features under the mounds at Silvașu de Jos have indicated slightly earlier dates (DIAONESCU 2020), but it must be stressed that all these dates were from charcoal samples, which might be affected by the old-wood effect. Ongoing excavations at Râmeț⁵ have shown that an Early Bronze Age grave was built in the centre of the enclosed area, covered with a stone and earthen cairn. The periphery of the grave was encircled by a stone ring, a second small stone enclosure being found in the western periphery, its function being unclear. The main tumulus is approximately 14 m in diameter (Fig. 7.4) and contains several burials with the skeletons deposited in contracted positions (Fig. 7.5) or commingled depositions of multiple individuals (Fig. 7.6). There are several cremation graves from the Middle Bronze Age (Wietenberg culture), which follows a pattern of the re-use of EBA tumuli during the MBA seen elsewhere in the Apuseni Mountains, at Cheile Aiudului, Cetea and Ampoița-Doșțior (CIUGUDEAN 1996, 62, 133). There is evidence of intact Coțofeni deposits under a small area beneath the Râmeț tomb. The mound fill contained redeposited Coțofeni ceramics and animal bones.

⁵ The excavations began in 2018 and are directed by Horia Ciugudean, together with Colin Quinn and Jess Beck, in the frame of a cooperation agreement between Hamilton College and Muzeul Național al Unirii, Alba Iulia.

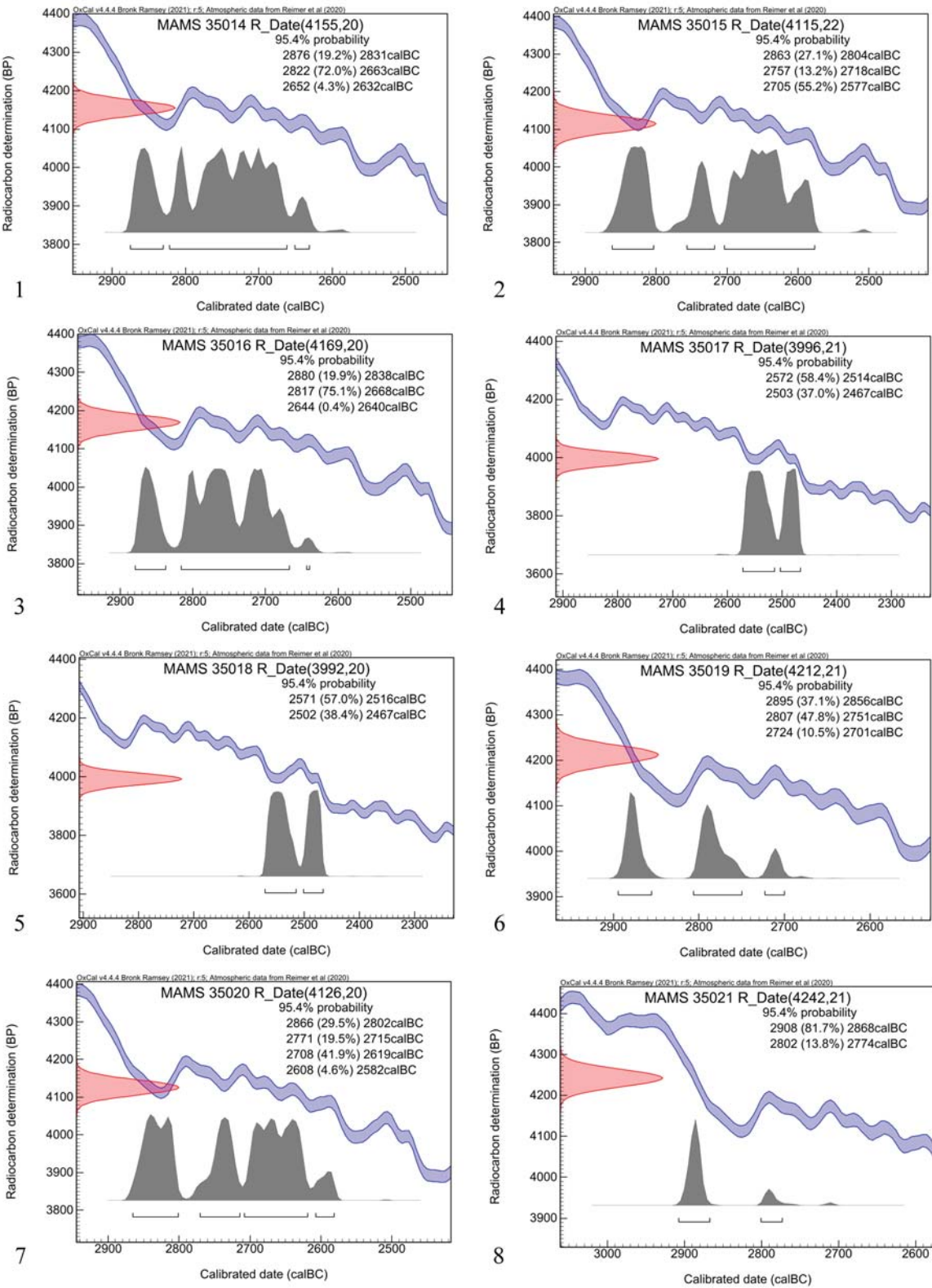


Fig. 6. Calibrated dates of the burials from the tumulus at Hăpria

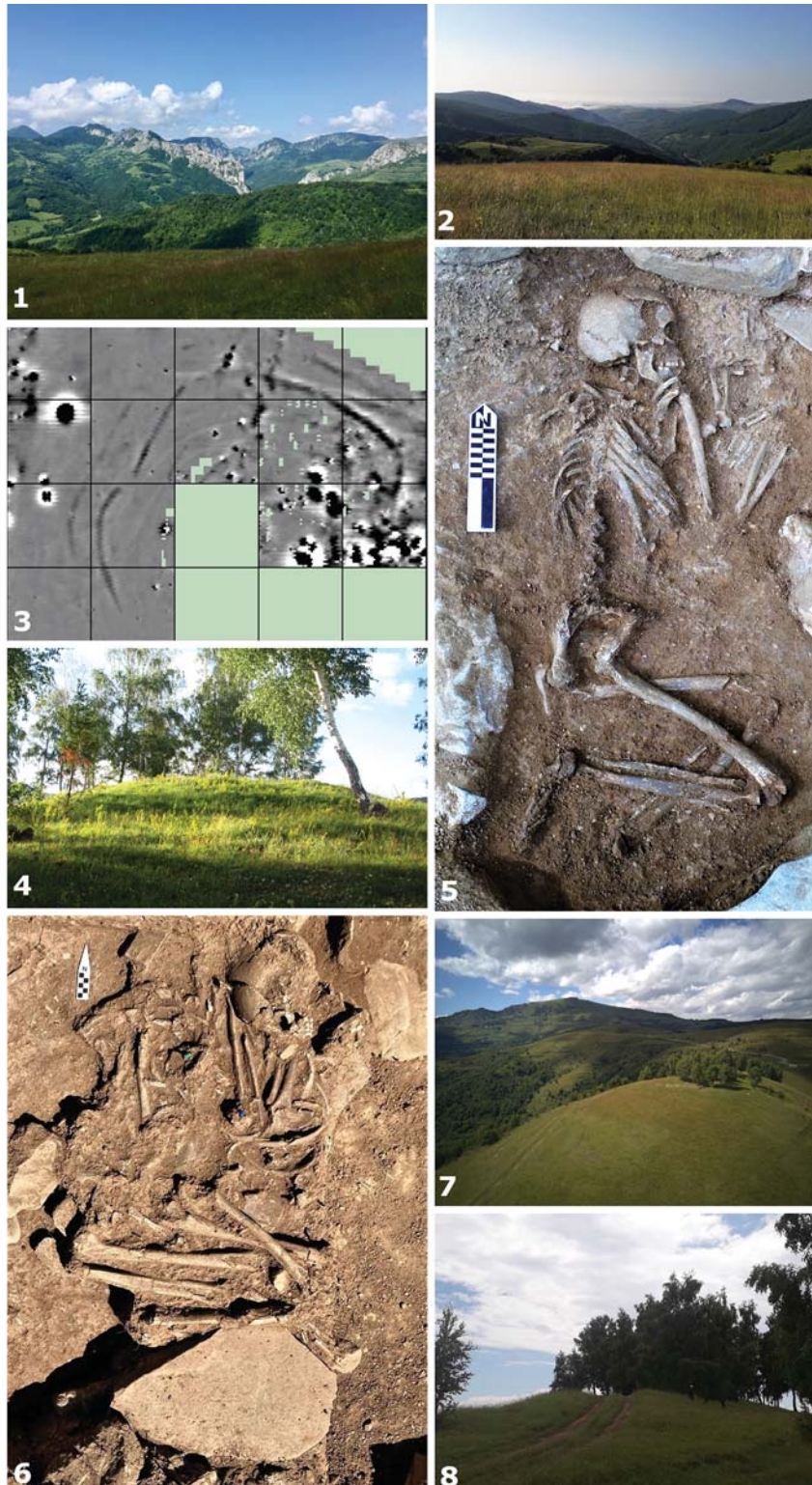


Fig. 7. The tumulus 1 from Râmeț – Gugu: 1. View to the west with the Monastery Gorge; 2. View to the south towards the Mureș valley; 3. Magnetometer survey of the tumulus area with the two enclosures visible in the imagery; 4. View of tumulus 1 before excavation; 5. Grave with the skeleton in contracted position; 6. The primary multiple grave; 7. Aerial view of the Gugu hilltop; 8. Tumulus north to the tumulus 1 (Photos by Horia Ciugudean)

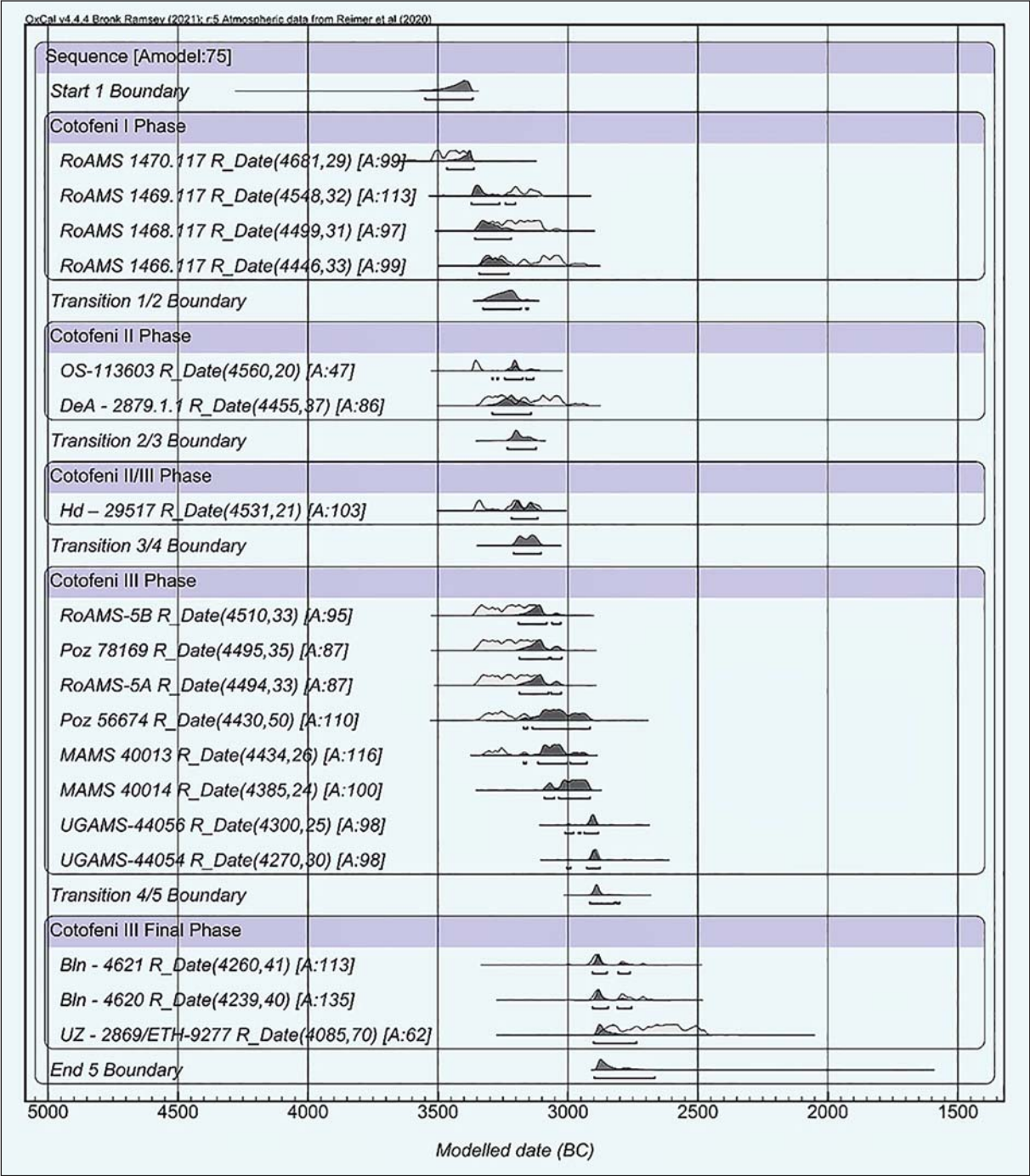


Fig. 8. The Bayesian model for the Coțofeni calibrated dates in Transylvania

At both Hăpria and Râmeț, it is likely that there was little to no hiatus between the latest occupation and the initial grave construction. A similar idea has been recently proposed in the case of the Yamnaya kurgan built over a Kostolac site at Jabuka (KOLEDIN *et al.* 2020). At Hăpria, the Coțofeni habitation extends to approximately 2900 cal BC and the earliest burials begin at the same time (Fig. 9). With excavations ongoing, it is not yet possible to determine how much time elapsed between the Coțofeni

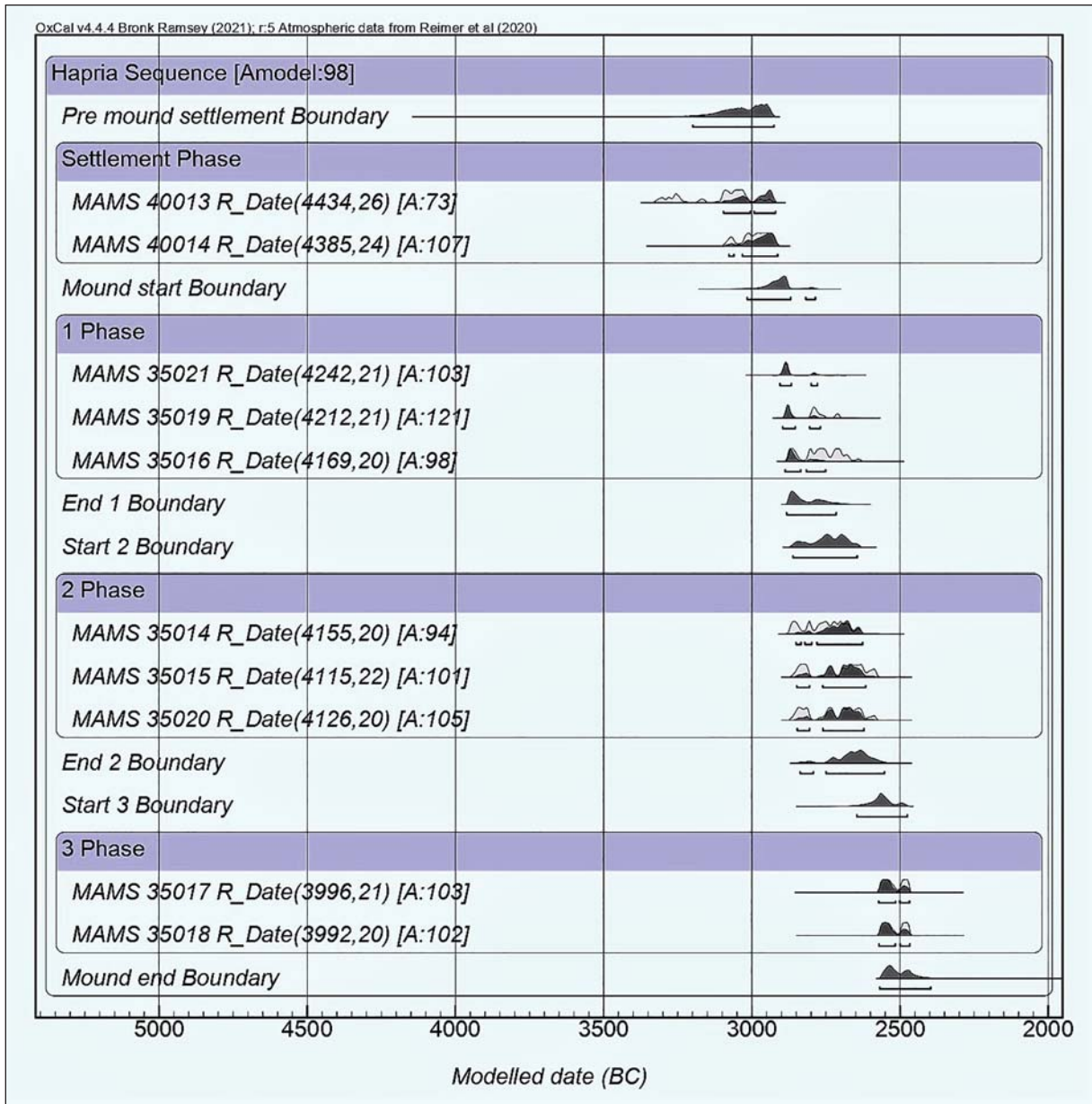


Fig. 9. The Bayesian model for the tumulus at Hăpria

occupation and mound construction at Râmeț. A similar situation seems to be recorded south of the Carpathians in the case of the Ariceștii-Rahtivani – *Movila pe Răzoare*, where Coțofeni III ceramics was found both as grave-goods, deposited in a pit (Cpl. 1), and spread over the ancient ground (FRÎNCULEASA 2020a). This situation can no longer be interpreted as two independent and separate chronological and cultural activities. One ^{14}C -AMS date has been sampled from the grave in Ariceștii-Rahtivani, on a human bone, calibrated with 2 sigma at 3318–2914 cal BC (FRÎNCULEASA 2020a, Fig. 3). If all the radiocarbon dates available for the Transylvanian region are taken into consideration, then the most probable lifetime for the Coțofeni III phase would be the period between 3200/3100–2900/2800 cal BC (Fig. 8). This period corresponds quite well with the chronological frame recently proposed for

the Coțofeni-Kostolac group in Serbia, particularly with the sequence provided by the seven samples (animal bones) from the site at Bubanj (BULATOVIĆ – GORI – LINDEN 2020).

The four dates from the Poiana Ampoiului site⁶ have been largely debated in the most recent studies dealing with the chronology of the Coțofeni culture, and the archaeological context for two of them have been questioned due to their considerably later age (BĂJENARU 1998; DIACONESCU 2020; FRÎNCULEASA 2020a). If we consider the sample UZ-2870 (4030±75 BP) as another outlier, then the three remaining dates from the Poiana Ampoiului site will fall, according to the Bayesian analysis, in the first third of the 3rd millennium BC (Fig. 8). They might well indicate the survival of the late Coțofeni communities in the western uplands of Transylvania, in a time when the Yamnaya expansion along the middle Mureș valley and its tributaries has already put an end to large Coțofeni hilltop settlements like Boarta, Măgura Căpuđului or Șincai. A similar survival after 3000 cal BC has also been supported more recently for the late Baden horizon (HORVÁTH – SVINGOR – MOLNAR 2008; SIKLÓSI 2009; KRAUSS – CIOBOTARU 2013; KULCSÁR – SZEVEŔENYI 2013). However, a longer lasting evolution of the Coțofeni III in western Romania until ca. 2650 cal BC, as it has been recently suggested (GOGÂLTAN 2015, fig. 10) cannot be accepted, and this interpretation has been rightfully criticized (DIACONESCU 2020).

Yamnaya arrival and ruptures in tradition

The beginning of the 3rd millennium BC broadly coincides with the arrival of the early Yamnaya groups in the Lower Danube (HEYD 2011; FRÎNCULEASA – PREDA – HEYD 2015; KAISER – WINGER 2015; ALEXANDROV 2021; FRÎNCULEASA 2021) and the Tisza Plain (HORVÁTH *et al.* 2013; DANI 2020).

In Transylvania, work at Câmpia Turzii (FERENCZI 1997) and other smaller excavations of earthen kurgans in the Mureș and Someș valleys date back several decades, but the presence of Yamnaya in Transylvania has only recently been acknowledged within the broader regional literature.⁷ The excavation of the Silvașu de Jos cemetery has not only confirmed the previous theoretical approach towards the Yamnaya phenomenon in Transylvania (CIUGUDEAN 1995; 1996; 2011), but it has provided a chronological benchmark for the penetration of the Yamnaya groups from the Banat region (DIACONESCU – TINCU 2016; DIACONESCU 2020; GOGÂLTAN 2021).

At both Hăpria and Râmeț, recent excavations have provided new information about the relations between the Yamnaya newcomers and local Late Copper Age societies, as well as revealed the realignment of local practices in response to a changing social environment. In terms of location, one site (Râmeț) is representative of the cultural landscape of the Transylvanian highlands, while the other (Hăpria) is a key locale for mapping the Yamnaya infiltration along the Mureș valley.

At Hăpria, ten burials were found in the perimeter of the tumulus, whereas the primary burial (ID 984) was located in the central area, at a depth of 0.70 m from the surface of the mound. The interred was placed on the back along an east–west axis, with the head to the west. The knees were drawn wide apart – in the so-called ‘froglike’ (germ. *Froschlage*) arrangement (Fig. 3.5), which is a special and rare type of burial, completely unknown in the EBA graves from the Apuseni Mountains (CIUGUDEAN 2011; GERLING – CIUGUDEAN 2013; BECK – CIUGUDEAN – QUINN 2020). So far, there is a single grave in Transylvania with a similar position in a kurgan near Câmpia Turzii (Fig. 10.9), and, according to the excavator, it was lying in the supine position on a mat, inside a pit covered with wooden beams, in

⁶ We have definitively excluded one date (UZ-2868) from our last analysis of the Poiana Ampoiului chronology, as it should be associated with the subsequent EBA occupation of the site (CIUGUDEAN 2015).

⁷ The evolution of distribution maps is highly significant, very few of them acknowledged the existence of a Yamnaya expansion in Transylvania till the last decade (e.g., DANI – KULCSÁR 2021).



Fig. 10. Various EBA graves with the skeleton in the frog position: 1. Mogila, 2. Blejoi, 3. Rudno Gore, 4. Jelsovice, 5. Vinogradnoe, 6. Lozianska, 7. Samborzek, 8. Smeenii, 9. Câmpia Turzii (after ALEXANDROV – KAISER 2016; FRÎNCULEASA 2021; WŁODARCZAK 2014; BĂTORA 2021; RASSAMAKIN 2013; GOGÂLTAN 2016)

which red ochre was also present (FERENCZI 1997). For a long time, this grave has been considered the best candidate for supporting a Yamnaya expansion in central Transylvania (CIUGUDEAN 1986; 1996; 2011; GOGÂLTAN 2016; 2021).

The recent excavation of the Silvașu de Jos cemetery offered new evidence not only for other Yamnaya-type burials in the south-west of Transylvania, but also for the existence of an older tumular horizon with Coțofeni cremation graves, which has been dated towards the very end of the 4th millennium cal BC (DIACONESCU 2020). As for the two Yamnaya burials, the dates calibrated with 2 sigma fall in the period ca. 2860–2600 BC (DIACONESCU – TÎNCU 2016), which corresponds quite well with the timeframe of the classical Yamnaya horizon on the Lower Danube (FRÎNCULEASA – PREDA – HEYD 2015; ALEXANDROV – KAISER 2016; FRÎNCULEASA 2021).

The bone sample (MAMS 35019) taken from the skeleton deposited in the primary burial at Hăpria (Fig. 3.5) produced a date of 4212 ± 21 BP which places the burial between 2895–2701 cal BC with 2 sigma calibration (Fig. 6.6). Another burial, which consisted of just a skull and a few vertebrae (Fig. 3.6) has provided a radiocarbon date of 4242 ± 21 BP (MAMS 35021), which delivers a slightly earlier timespan with 2 sigma calibration (2908–2774 cal BC) (Fig. 6.8). Both of these dates fit with the ones at Silvașu de Jos, as well as with the EBA secondary burials (Gr. 4 and Gr. 9) from Sárretudvari-Órhalom (DANI – NEPPER 2006; DANI – KULCSÁR 2021).

Sample MAMS 35018 from another burial (ID 731) provided the radiocarbon date of 3992 ± 20 BP, which is the youngest date in the tumulus. Calibrated with 2 sigma, it is placed in the period 2571–2467

cal BC (Fig. 6.5). This date marks a second phase of interments in the kurgan, close to the date of the secondary burial in tumulus II at Livezile-Baia (GERLING – CIUGUDEAN 2013) (Fig. 15). It should be noted that a contracted EBA burial in the mound with stone ring at Florești-Polus (ROTEA *et al.* 2014) has provided a radiocarbon date of 3930±30 BP, which partly corresponds to the Hăpria calibrated date (Fig. 16). South of the Carpathians, four graves belonging to the Katakombnaya stage in the mound at Smeeni were dated to the same period, considered to be a phase of coexistence with the Yamnaya burials (FRÎNCULEASA 2021). All the other graves in the Hăpria mound fall into the first half of the 3rd millennium BC (Fig. 6), but none of them has any grave-goods or a more elaborated funerary architecture that would connect them to the mortuary landscape of the Carpathian Basin. However, the presence of a second skeleton (ID 984), with its knees drawn wide apart – in the so-called ‘froglike’ arrangement – clearly differentiates the Hăpria burials from those excavated to date in the barrows of the Livezile group. It is difficult to ascertain whether the dead buried in these features had their knees pointed up, after bending their legs, or if they were originally drawn apart. Whatever the answer, the arrangement obviously differed from the pattern followed by local communities. Its uniqueness is supported by the arrangement of upper limbs, strongly departing from patterns followed in Apuseni Mountain burials (CIUGUDEAN 1991; 2011; MOTZOI-CHICIDEANU 2011; BECK – CIUGUDEAN – QUINN 2020). The similar position of lower and upper limbs in the two Hăpria burials and in the case of the skeleton at Câmpia Turzii (Fig. 10.9), the last deposited in a rectangular pit covered with beams and powdered with ochre, relate them closely to a particular Yamnaya-type burial (TELEGIN – PUSTOVALOV – KOVALYUKH 2003; HEYD 2011; RASSAMAKIN 2013; ALEXANDROV – KAISER 2016; PREDA-BĂLĂNICĂ – FRÎNCULEASA – HEYD 2020). Y. Rassamakin called this the second burial tradition (RASSAMAKIN 2013), while A. Frînculeasa assigned it to the first burial stage at Smeeni and dated it between 3050–2900 BC (FRÎNCULEASA 2021). In a previous study, the burial scheme 2, which includes all the individuals lying supine with their legs flexed at the knees (Fig. 10.1, 5–6), is entirely placed after 3000/2900 BC (FRÎNCULEASA – PREDA – HEYD 2015). In case of the two skeletons at Hăpria with their knees drawn wide apart, both of them are clearly dated after 2900 cal BC (Fig. 9). The rhomboidal arrangement of legs was mirrored by the same arrangement of arms, which may indicate intentional placement. The burial at Hăpria had no funerary chamber, (not even a deep pit!), and no wooden protecting planks, so the position of the lower limbs cannot be interpreted as a post-burial (fallen) position. Similar observations made in the Podolia kurgans indicate that this was a specific variant of body position, with knees distinctly spread, most likely applied to males (WŁODARCZAK 2017). However, it should be noticed that the rhomboidal arrangement of legs it is not exclusively connected with the customs of Yamnaya communities, where most of the analogies can be found, but occasionally found in cemeteries belonging to other cultures, such as Corded Ware or Nitra (Fig. 10.3–4, 7).

The single variant of burial at Hăpria, which might be related to the funerary customs of Livezile group, is the commingled and disarticulated deposit (ID 766-789) of 138 bones and 46 teeth from at least five individuals, including one child, one adolescent, and three adults (Fig. 3.7). The skeletal remains in the deposit consist predominantly of the bones of the skull and the upper and lower limbs.

One good and securely dated parallel from the Livezile group is provided by some of the graves from tumulus 1 excavated in 1994 (CIUGUDEAN 1996) at Meteș-*La Meteșel*. The site is an upland EBA cemetery located along a ridge between the Ampoi and Albinii valleys (Fig. 11.1), in the south-western region of the Trascău Mountains (Fig. 1.7; 2). Tumulus 1 is a large structure with a circular shape that extends approximately 15.5 m in diameter and 1.5 m in height. Its internal structure was composed of two concentric stone rings that were covered with a beaten earth mantle and housed eight different deposits of human remains – six inhumations (Gr. 2, Gr. 3, Gr. 4, Gr. 5, Gr. 6, and Gr. 7) and two cremations (Gr. 1 and Gr. 8) (Fig. 11.5). Bioarchaeological analysis (BECK – CIUGUDEAN – QUINN 2020)

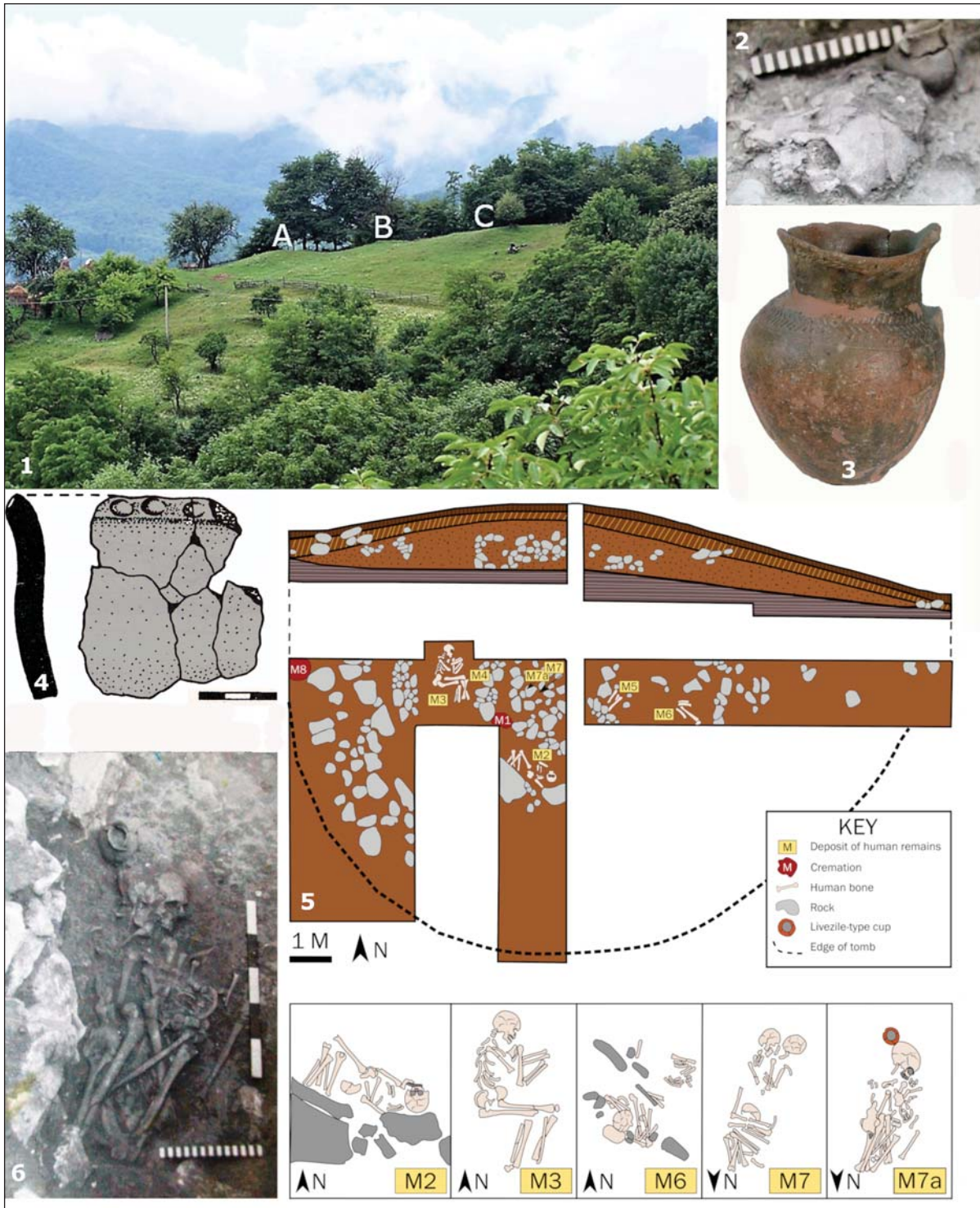


Fig. 11. The tumulus I from Meteş - La Meteşel: 1. General view of tumulus I (A) with other two mounds (B, C) along the ridge; 2. The skull of the male in grave 7-7a with the nearby cup in situ; 3. The Livezile-type cup from grave 7-7a; 4. Yamnaya-type ceramic found in the fill of the tumulus; 5. Plan of the excavated area with the position of the bone deposits; 6. View of the primary grave with the packed bones of a male (Photos and drawings by Horia Ciugudean)

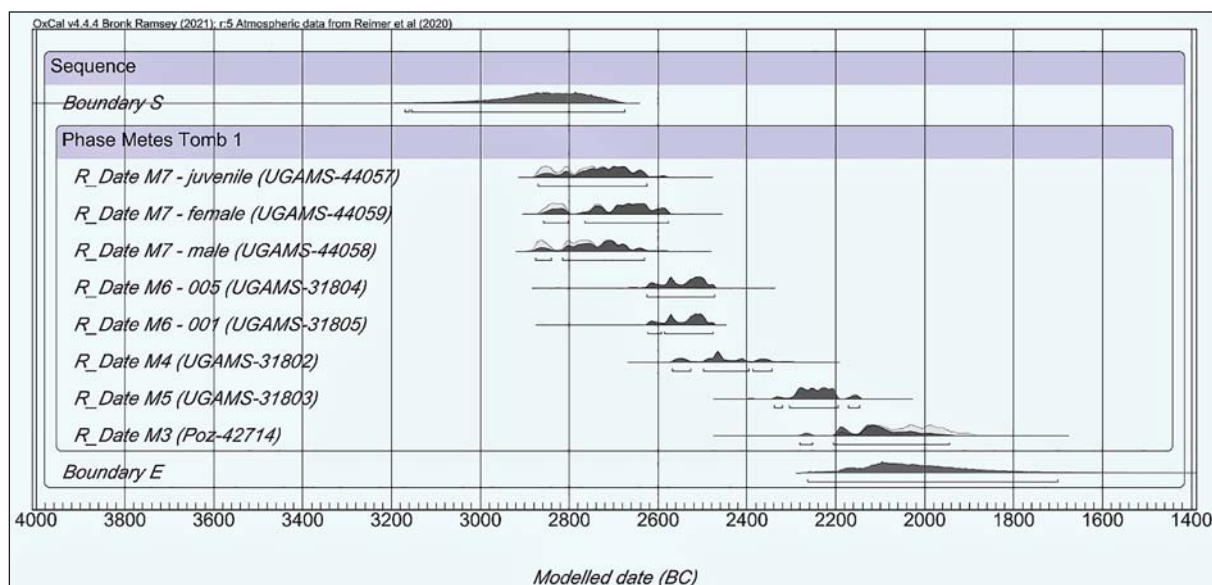


Fig. 12. The Bayesian model for the tumulus at Meteş

revealed that Gr. 6 is a commingled deposit containing at least six individuals (Gr. 6 – Fig. 11). Gr. 7-7a consists of a commingled deposit of three individuals: the initial deposition of an adult male, positioned with the skull on the left side, facing east, with limbs bundled (Fig. 11.6), and then another adult female and adolescent deposited directly above it, placed in flexed positions on their right sides, heads facing west. A Livezile-type cup was placed just behind the head of the adult male (Fig. 11.2–3). The bone sample taken from the skeleton (UGAMS-44058) produced a date of 4170 ± 25 BP, which places the individual between 2880–2670 cal BC with 2 sigma calibration (Fig. 12).

The Livezile-type cup found at Meteş has already been connected with the one deposited in grave 9 (Fig. 14.1) in the tumulus at Sărrétudvari-Örhalom (DANI – NEPPER 2006), and it has also good parallels in the tumulus VIII at Ampoita-Peret (Fig. 14.3) and in the settlement from Cicău (Fig. 14.2). The age of grave 9 from Sărrétudvari-Örhalom (deb 6871: 2859–2489 cal BC, calibrated with 2 sigma) belongs to the same time-horizon as the animal bone (Bln-4624) sampled in the settlement at Livezile-Baia (Fig. 15). However, it is important to underline that the frog-like position of the legs in grave 9 fits quite well with the one known in the Yamnaya-type burials, including the two graves at Hăpria, but has no parallel in the Livezile graves. As a matter of fact, the theory regarding the Transylvanian origin of some individuals from the Sărrétudvari-Örhalom tumulus (GERLING *et al.* 2012) was shown to be erroneous, after the strontium and oxygen isotope analyses of six individuals from three different EBA sites in the Apuseni Mountains showed consistent discrepancies (GERLING – CIUGUDEAN 2013). The Livezile character of the ceramics in the graves 4 and 9 (DANI – NEPPER 2006) is beyond doubt, but there is no evidence that the origin of the outliers at Sărrétudvari-Örhalom is the Transylvanian highlands of the Apuseni Mountains, and their regional affiliation may be in another area of Transylvania. The middle Mureş valley might be a better candidate for a contact zone between the Yamnaya newcomers and the Livezile group, the tumulus from Hăpria and the Livezile site at Bărbant-Pârâul Iovului being separated by less than 7 km (Fig. 2).

Coming back to the cup deposited in grave 7 at Meteş, it clearly indicates that the emergence of Livezile-type ceramics started quite soon after 2900 cal BC, in a time when late Coţofeni patterns were still in use in remote areas (RIŞCUŢA – COSAC – PAVEL 2012; POPA – FAZEKAŞ 2013). According to our

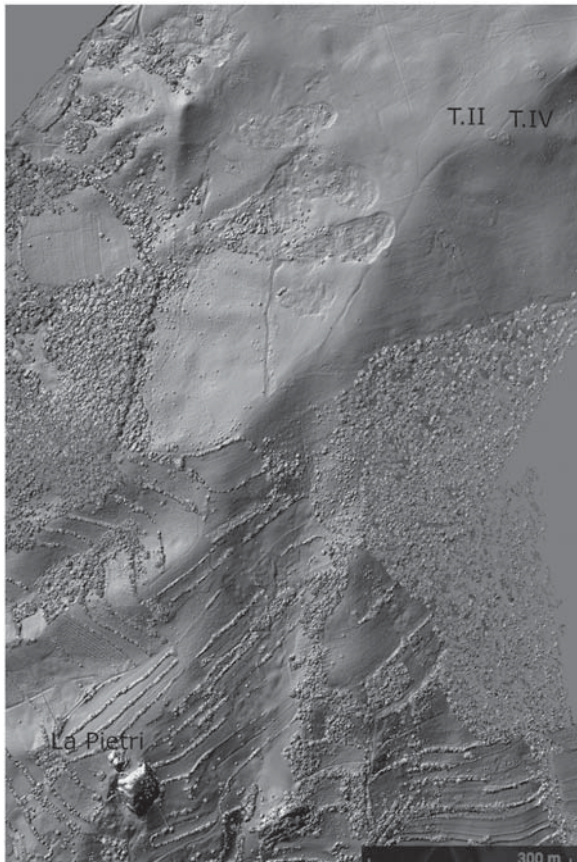


Fig. 13. Drone imagery of the settlement (La Pietri) and tumulus burials at Ampoița - Peret

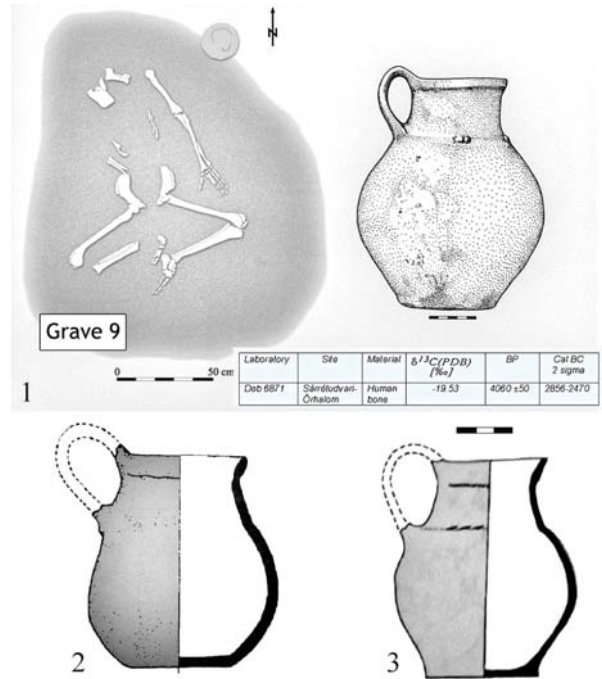


Fig. 14. The grave 9 from Sărrétudvari-Örhalom (1) with the Livezile-type one-handed cup and similar cups from Cicău (2) and Ampoița-Peret (3) (after DANI – NEPPER 2006 and CIUGUDEAN 1996)

Bayesian analysis of the skeletons sampled in the tumulus at Meteș, three main phases of interments can be clearly separated in the burial mounds from the Apuseni Mountains (Fig. 12). The first phase can be roughly placed between 2850/2800–2600/2500 BC and is represented by the primary grave Gr. 7-Gr. 7a, where the Livezile cup was found. The second phase is represented by the commingled deposit from Gr. 6, where two individuals were sampled (UGAMS-31804 and UGAMS-31804), the results calibrated with 2 sigma being almost identical: 2630–2480 cal BC and 2620–2480 cal BC (Fig. 12). This interval overlaps almost perfectly with the radiocarbon date (Poz-42712: 2621–2468 cal BC, calibrated with 2 sigma) from individual 2 in tumulus 2 at Livezile-Baia, located in the northern periphery of the cemetery (GERLING – CIUGUDEAN 2013) (Fig. 15). Grave-goods are missing in both graves, so it is difficult to connect them with a specific cultural group, but we consider them a benchmark for the end of the Livezile group, the latest examples of which occur around 2500 cal BC.

A possible relation might be suspected with the Soimuș group, whose ceramics have been found in the cremation Gr. 8 in the same tumulus (CIUGUDEAN 1996; BECK – CIUGUDEAN – QUINN 2020). The third phase of interments at Meteș is represented by two other graves, Gr. 4 and Gr. 2, which provided calibrated dates (UGAMS-31802: 2570–2340 cal BC, and UGAMS-31803: 2340–2150 cal BC with 95.4% probability), considerably later than Gr. 6. The age of Gr. 4 corresponds to the one of the graves sampled in tumulus R1 at Florești-Polus (Beta-317258: 2490–2340 cal BC (Fig. 16), which are supposed to belong to the so-called Copăceni group (ROTEA *et al.* 2014). If the cultural affiliation of the EBA graves at Florești is correct, then it is quite clear that Livezile and Copăceni cannot be

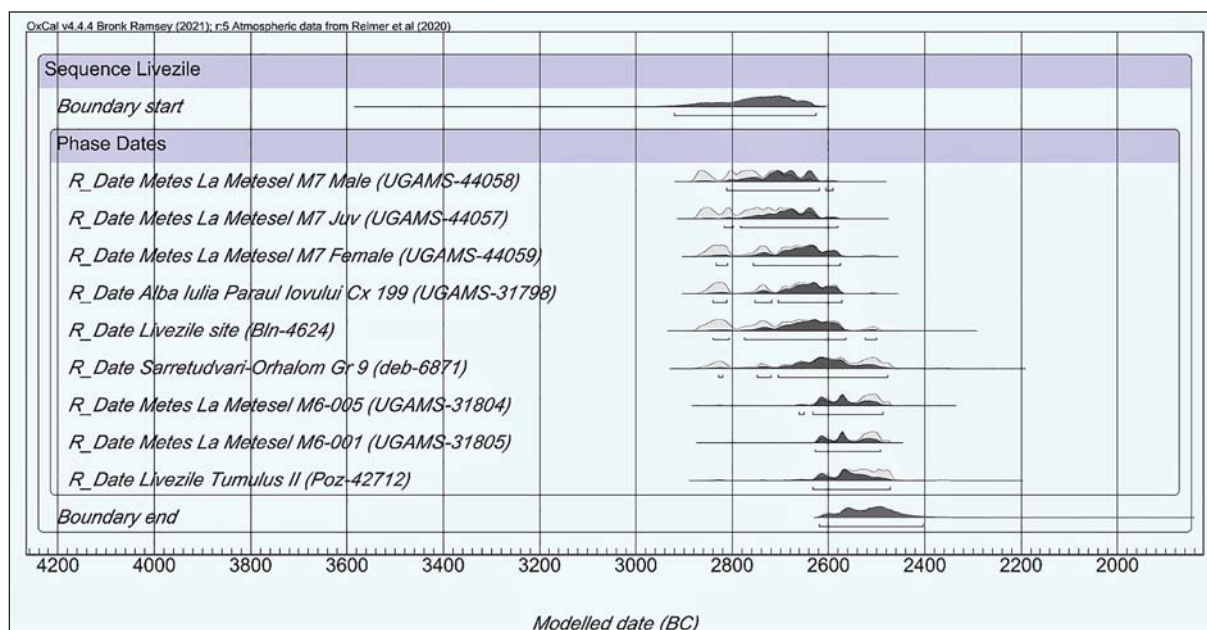


Fig. 15. The Bayesian model for the Livezile dates from Transylvania, also including the date from Sárretudvari-Órhalom

identical or contemporary, as some authors are still maintaining (ROTEA 2003; 2009; GOGÂLTAN 2015; 2016). In the light of the new radiocarbon dates, our initial proposal for a successive evolution from Livezile to Copăceni (CIUGUDEAN 1996) has now been shown to be correct. Finally, we also have to specify here the existence of a very late interment, represented by Gr. 3 (Poz-42714: 2196–1903 cal BC with 95.4 % probability), indicating probably a secondary burial without any cultural affiliation to the primary graves (GERLING – CIUGUDEAN 2013) (Fig. 12). This is not an isolated situation, as MBA Wietenberg cremation graves and ritual pits were often found in the EBA tumuli of the Apuseni Mountains (CIUGUDEAN 1996; 2011). According to the present state of research, the age of Gr. 3 is the time when the Transylvanian lowlands were mostly dominated by the EBA III groups⁸, using the characteristic rusticated ceramics (*Besenstrich- und Textilmuster Keramik*), a ceramic style completely missing in the highlands (CIUGUDEAN 1996). The EBA III site at Alba Iulia-Recea provided a calibrated date (Hd-29056: 2125–1919 cal BC with 95.4% probability) which fits quite well with the age of Gr. 3 at Meteş (Fig. 16), as well as with the radiocarbon dates from EBA III sites in Banat (GOGÂLTAN 2015).

The radiocarbon dates from the tumulus at Meteş are also supported by the dates of the bone samples originating from the Livezile settlements (Fig. 15), such as Livezile-Baia and Alba Iulia-Pârâul Iovului,⁹ so that the lifetime of the Livezile group can be estimated to a period of ca 300 years, between 2900/2800–2600/2500 BC (Fig. 15). The previous chronological estimations, based on scanty information, have been shown to be prematurely published (GOGÂLTAN 2015; 2021).

According to the present state of research, the Yamnaya graves at Silvaşu de Jos (DIACONESCU 2020) and Hăpria have a coeval evolution with the Livezile burials in Transylvania, restricted to the first half of the 3rd millennium BC (Fig. 16). The Livezile interment phase has good chronological connections with

⁸ For the absolute chronology of this extended horizon (Foeni – Iernut - Zoltan), see the radiocarbon dates from the Banat region (GOGÂLTAN 2015) and south-eastern Transylvania (HARDING – KAVRUK 2013).

⁹ The excavations were made by an archaeological team (S. A. Luca, V. Palaghie, and Gh. Natea) from the Brukenthal Museum Sibiu and the results will be published in a future study. The archaeological materials are now preserved in the collections of the Muzeul Național al Unirii Alba Iulia.

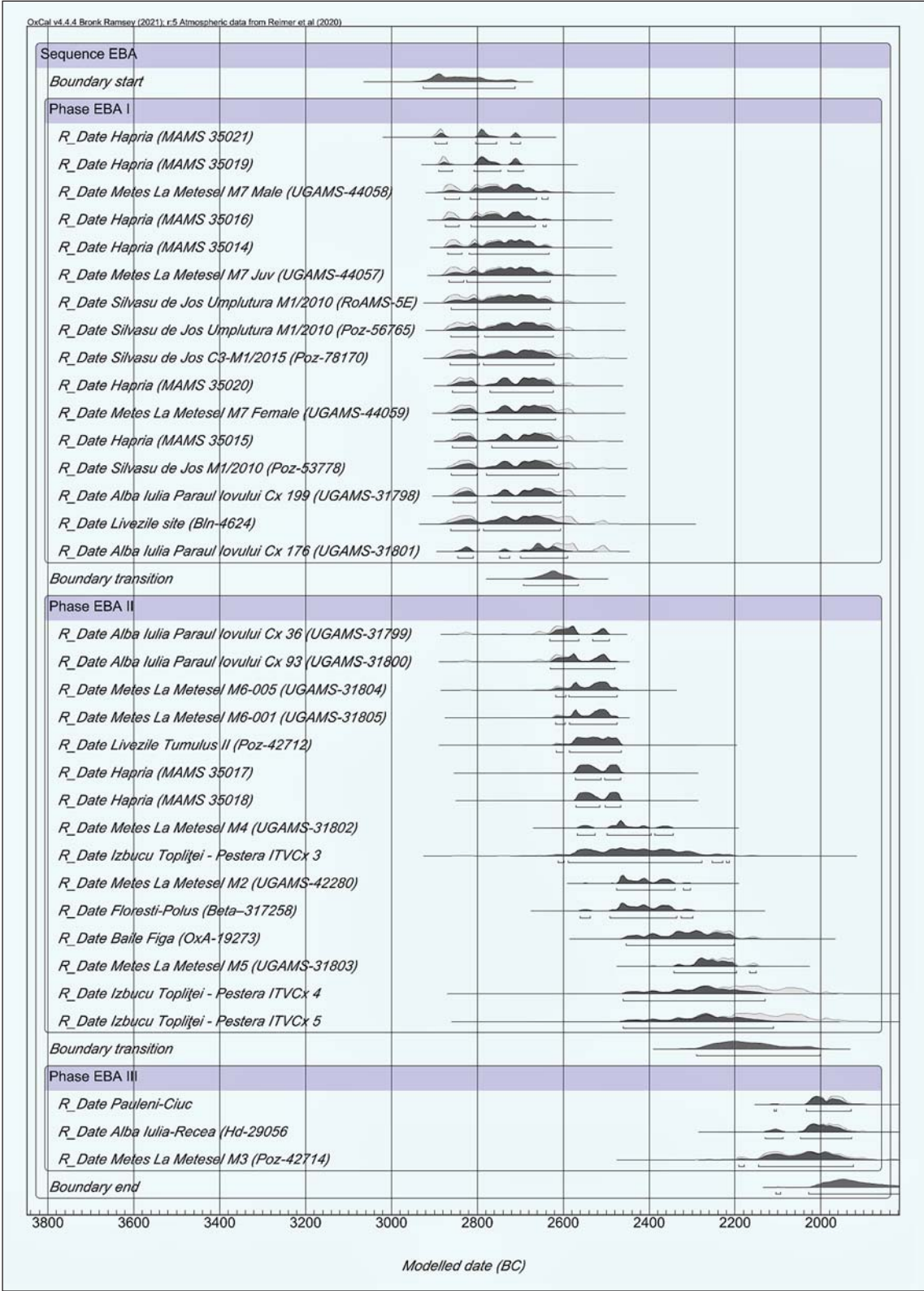


Fig. 16. The Bayesian model for the Early Bronze Age dates in Transylvania

the classical Yamnaya burials in the Lower Danube region (AILINCĂI *et al.* 2014; FRÎNCULEASA – PREDA – HEYD 2015; FRÎNCULEASA 2021). It also corresponds with part of the so-called Period IV, proposed for the steppe cultures in Hungary (HORVÁTH *et al.* 2013), as well as with the second stage of burials in the kurgans of the Vojvodina region (KOLEDIN *et al.* 2020). This hypothesis does not exclude the existence of tumulus burials before 3000 cal BC, as seems to be the case with the Coțofeni cremation graves at Silvașu de Jos (DIACONESCU – TÎNCU 2016; DIACONESCU 2020), which corresponds to the so-called pre-Yamnaya phase¹⁰ from the Lower Danube (FRÎNCULEASA 2021; ALEXANDROV 2021) and the Tisza plain (HORVÁTH *et al.* 2013).

Funerary practices and dis/continuities

The arrival of Yamnaya corresponded with several changes in behaviour seen across the Carpathian Basin and Transylvania. However, we must look closely to see if these changes reflect the replacement of people, the diffusion of ideas, or the realignment of local practices in response to a changing social environment. The first shift in behaviour is seen in mortuary practices. Even a cursory examination of the regional record reveals that the movement and redeposition of human remains is a recurring motif in the ritual grammar of the Livezile EBA barrows of southwestern Transylvania. For example, in the multiple burial Gr. 7-7a at *Meteș-La Meteșel*, two adults, a male and a female, were interred together with a 14–16-year-old adolescent (BECK – CIUGUDEAN – QUINN 2020). At *Ampoia-Peret*, assemblages of disarticulated human remains were present in Tumulus II (Grave 7), Tumulus V (Grave 1), Tumulus VII (Grave 2), and Tumulus VIII (Grave 4) (CIUGUDEAN 1996). High levels of disarticulation are likewise reported for multiple graves from Tumulus II at *Țelna-Rupturi*, with at least one commingled grave also observed (CIUGUDEAN 1995; 1996). Indeed, one of the major tracks characterising the eponymous Livezile culture incorporates “disarticulated skeletons, the bones being deposited, in whole or in part, in the form of a ‘package’” (CIUGUDEAN 1996, 80). This observation was supported by Motzoi-Chicideanu, who numbered 24 multiple graves out of a total of 65, and considers bone manipulation as one of the characteristic rituals in the Livezile burials (MOTZOI-CHICIDEANU 2011, 311). The tumulus excavated at Hăpria delivered a commingled and disarticulated deposit (ID 766-789) of the skeletal remains of at least five individuals, including one child, one adolescent, and three adults, consisting predominantly of cranial and appendicular remains (Fig. 3.7).

Such practices extend beyond Transylvania to western Moldavia – at the Bronze Age site of *Costișa-Cetățuia* (Neamț County), several graves and isolated human skeletal elements were found scattered throughout the site (POPESCU – SOFICARU – MĂRGĂRIT 2016, 83). A commingled deposit (Gr. 2) discovered in the same site contained five skeletons and was radiocarbon dated between 2620–2470 cal BC (95.4% probability). The time span corresponds quite well with the dating of Gr. 6 at *Meteș* and with the date from tumulus II at *Livezile-Baia* (Fig. 15). No less important is the fact that the ceramic offerings have good parallels at Aldești, Foltești and Zăbala, as well as in the Livezile group (POPESCU – BĂJENARU 2008, 68). As for the regions between the Prut and Dniester rivers, the presence of secondary depositions of human remains have been documented in 26 burials at Yamnaya sites (AGULNIKOV – POPOVICH 2010). The researchers date these burials to the end of the 3rd and beginning of the 2nd millennium BC (based on relative dating techniques), well after the initial interaction between Steppe-migrants and local EBA communities in the Carpathians. NEBRAT (2013) and LYSENKO and RAZUMOV

¹⁰ In a recent study, D. Anthony supports a different chronology, based on new radiocarbon dates. These dates suggest that early Yamnaya sites and assemblages began to appear about 3300–3200 BC. Late Yamnaya, correlated with Mikhailovka level III, is dated 3000 BC and later (ANTHONY 2021).

(2016) document disarticulated secondary remains in the North-West Black Sea region. These secondary deposits are associated with the Ingul Katakombnaya culture, an archaeological culture that post-dates the Yamnaya (starting around 2800 BC) (OTROSHCHENKO 2013).

Despite their abundance in Transylvania, manipulation of bones and secondary deposits have not been previously identified as an important part of Yamnaya cultural practices south of the Carpathians (FRÎNCULEASA – PREDA – HEYD 2015). It is important to note that an early post-mortem manipulation of disarticulated remains was documented in a collective grave (Gr. 1) at Ariceștii-Rahtivani-*Movila pe Răzoare* that was associated with Coțofeni material culture (FRÎNCULEASA 2020a). Commingled deposits and the post-mortem manipulation of bones are even considered characteristics of the pre-Yamnaya horizon in the Prahova region (FRÎNCULEASA 2021). A recent discovery of a burial with incomplete human remains has been made in Vojvodina at *Žabalj-Medisova humka* (JAROSZ *et al.* 2021), and it was radiocarbon dated between 2858–2625 cal BC (68.2% probability). Overall, the Early Bronze Age mortuary record across the Transylvanian region thus shares a series of common mortuary motifs, including the skeletonization and disarticulation of some assemblages of human remains prior to deposition in mortuary mounds, the commingling of multiple individuals in single graves, and the coexistence of multiple forms of funerary treatment within the larger mortuary sphere of the mounded upland tomb cemetery.

Given that bone manipulation and secondary depositions are observed across a wide variety of cultures and time periods, the social significance of this practice must not be simplified in an effort to create a singular explanation for its role in mortuary programs. Instead, we must contextualize discussions of secondary depositions in Transylvania in their direct historical context.

The second major change in mortuary behaviour coincident with the arrival of Yamnaya is the link between EBA cemeteries and Coțofeni sites, seen both at Hăpria and Râmeț, which is part of a broader pattern of EBA communities transforming Late Copper Age settlements into mortuary spaces. Clay hearths, together with Coțofeni ceramics, have been found in the central area of several mounds, at Ampoița-Peret, Livezile-Baia (CIUGUDEAN 1991; 1996; 1997; GERLING – CIUGUDEAN 2013), Cetea-Picuiata (POPA *et al.* 2006). A similar situation has been identified in the cemetery at Cheile Aiudului, where several mounds covered Coțofeni III occupation deposits, with fire marks and broken pottery. A vessel with burnt grains, associated with a clay idol of Bucranium-type (*Fig. 17.1–2*) was found in the area of tumulus V¹¹ and clearly testifies traces of ritual activities performed prior to the first setting of burials (VLASSA – TAKÁCS – LAZAROVICI 1987; CIUGUDEAN 1996). In some cases, such as Ampoița-Peret (CIUGUDEAN 1991; 1996; 2011), habitation debris was transported more than 1 km from the settlement to be incorporated into the mounds (*Fig. 13*). This demonstrates that EBA communities deliberately incorporated settlement debris into mounds and that it was not only the result of being close at hand when constructing tombs. In Messenia at Kastroulia, the fill of the two Middle Helladic I mounds has yielded a large quantity of almost exclusively Early Helladic II pottery, although the nearest EH II settlement is located on the opposite side of the river (MÜLLER-CELKA 2011). Like at Ampoița-Peret, this suggests people intentionally transported and included earlier deposits into the mounds.

The transformation of the domestic space into community monument is a practice well known elsewhere in Europe. In southern Greece, a former EH II building was interred in a tumulus at Thebes (MARAN 1998, 227–228). At Lerna, after the end of Lerna III, a low circular mound formed of debris from the destruction of the “house of the tiles” covered almost the entire area of the building (ARAVANTINOS – PSARAKI 2011, 409). The construction of these monumental earthworks signifies respect for the domestic units they cover.

¹¹ Similar idols were discovered in the Coțofeni settlement at Boarta (DUMITRAȘCU – TOGAN 1971, pl. 6/419), as well as in the Vučedol C settlement at Dunaszekcső-Várhegyről (ECSÉDY 1985, pl. 8/5).



Fig. 17. Clay idol of Bucranium-type from the EBA cemetery at Poiana Aiudului (1), and view in situ of the pot with grains and the idol in tumulus 5 at Poiana Aiudului (2), the reproduction of a spectacle-shaped pendant on Coțofeni III ceramics from Sebeș-Râpa Roșie (3) (Photos by Horia Ciugudean)

The burying of the “house of the tiles” may represent not only the end of the social life of this specific unit but also the end of the specific social reality of the EH II period (WIENCKE 2000, 297–298).

There are other cases outside of Transylvania of Copper Age sites being transformed into EBA cemeteries. South of the Carpathians there are similar cases where Yamnaya mounds were often built over Cernavodă II–Foltești II sites (FRÎNCULEASA 2020a, 44). The situation becomes more complex in the case of several tumulus burials where Cernavodă II pottery was part of the grave-goods too (FRÎNCULEASA 2020b). In Messenia, the burial mound at Voidokilia provides a clear example of recycling an earlier domestic space into a burial ground. Traces of ritual activities under the mounds at Olympia-New Museum, Ayios Ioannis and Routsis suggest community rituals – even if not funerary – were performed prior to mound construction. The evidence therefore allows the hypothesis that the monumental and ritual functions preceded mortuary functions (MÜLLER-CELKA 2011, 421–424). This hypothesis can be applied as well towards part of the Transylvanian EBA mounds, and in this case, it might force us to revive Vlassa’s older theory about the internal chronology of the Poiana Aiudului cemetery: an earlier Coțofeni phase, followed by a post-Coțofeni one (CIUGUDEAN 1977, footnote 13; 1986, 69, 72; VLASSA – TAKÁCS – LAZAROVICI 1987).

It cannot be ruled out that the descendants of the Coțofeni people also took part both in the rituals performed on the Râmeț-*Gugu* hilltop and in the building of the monument itself. Only the presence of genetic affinity between the Coțofeni and Livezile individuals would certify (or disprove) the validity of this hypothesis. A distinction must be made, however, between the sites where the Livezile barrows were laid over deserted Coțofeni settlements and sites where the late Coțofeni descendants transformed domestic space into community funeral monument. In the lowlands, the situation might be quite different and Hăpria seems to represent the case of an earthen mound built over the debris of a Coțofeni III house by a Yamnaya community. The meaning of this act is also completely different, the kurgan representing the manifestation of possession and territory (HEYD 2011; DANI 2020).

The strong persistence of the Coțofeni ancestry, particularly in the highlands, could be a plausible explanation for the birth of the new EBA Livezile group,¹² which still use some Coțofeni decoration patterns and pottery shapes (CIUGUDEAN 1996; 1997). But it is not enough to explain the presence of many other new patterns, part of them also present in the Zăbala-type finds from south-eastern Transylvania, as well as in the Cernavodă II-Foltești repertory or the Aldești-type finds from Moldavia (CIUGUDEAN 1996; 2013; BURTĂNESCU 2002).

The earlier dates of the burials associated with Coțofeni pottery in the mounds at Ariceștii-Rahtivani (FRÎNCULEASA *et al.* 2014; FRÎNCULEASA 2020) point towards a late 4th millennium BC beginning of a close relationship between western Transylvania and the sub-Carpathian area of Prahova. Coțofeni III communities came into contact with groups beyond the bounds of the Carpathian Mountains, including communities in northern Oltenia (ȚUȚULESCU 2016a, 140; ȚUȚULESCU 2016b) and the Cernavodă II–Foltești II people living between the Danube and southern Carpathians (FRÎNCULEASA 2020a). Cernavodă II groups made their appearance in south-east Transylvania around 3000 cal BC, maybe as a result of the Yamnaya expansion along the Lower Danube (HEYD 2011; FRÎNCULEASA 2020b; PREDA-BĂLĂNICĂ – FRÎNCULEASA – HEYD 2020). Evidence for these groups might be seen in the Zăbala-type ceramics (SZÉKELY 1997), as well as in the movement of the southern askos-type jugs, deposited in the graves at Sânzieni and Turia (ROMAN 1986; MOTZOI-CHICIDEANU 2011). The large hilltop Coțofeni settlements, such as Boarta, Șincai, Măgura Căpușului (CIUGUDEAN 2000), seem all to cease their evolution by the end of phase IIIb, at ca. 2900 cal BC, when the first Yamnaya groups crossed from Banat to Transylvania through the Iron Gates of Transylvania,¹³ and the Mureș valley (*Fig. 1*). This chronological frame is well documented both at Silvașu de Jos and Hăpria, where the first burials of Yamnaya individuals cannot be earlier than 2900 cal BC, as the radiocarbon dates clearly show (*Fig. 16*). The displaced late Coțofeni population of central and south-western Transylvania, mixed with the Cernavodă II–Foltești II groups, that were already a local presence in the south-east of the region, have given birth to the Livezile group, mainly distributed over the upland regions of the Apuseni Mountains (CIUGUDEAN 2013, 20; 2021, 57–59).

Together, these lines of evidence combine to confirm that the movement of Yamnaya communities into the Carpathian Basin and lowlands of southwest Transylvania did not result in a full rupture and

12 Some Romanian researchers still prefer to call it either the Coțofeni IV phase (LAZAROVICI 1997; ȚUȚULESCU 2016a) or an “epi-Coțofeni” phenomenon (RIȘCUȚĂ 2008). Ignoring the absolute chronology of the radiocarbon dated finds, a few others include all the Livezile sites into the so-called Copăceni group (ROTEA 2003; 2009; RIȘCUȚĂ – POPA – FERENCZ 2009; POPA 2012; BERETEU – ROTEA 2022).

¹³ We consider the use of this easy mountain path, which better explains the location of the Yamnaya cemetery at Silvașu de Jos, as a more accessible route than travelling through the Mureș valley (DIACONESCU 2020). Most of the prehistoric populations coming from the Banat region seem to follow the same route and reach the middle Mureș valley in the Simeria area (see the distribution of the Middle Bronze Age Balta Sărată group, the Late Bronze Age Susani finds, or the Early Iron Age Basarabi culture). The Roman army marched along this path as well, and fought a battle with the Dacian army in the area at the beginning of the 2nd century AD.

replacement of the people and traditions of the Late Copper Age landscape. This view supports the call for a more complex social context of large-scale migration in European prehistory.

Carpathian Basin influence of the steppe

An element of Yamnaya migration that is often overlooked is the effect that its interactions with the local societies had on the Eurasian Steppe. Yamnaya would have been changed by having interacted with the Late Copper/Early Bronze communities in the Carpathian Basin and Transylvania. The trade and social relationships that developed between local groups and Yamnaya newcomers resulted in a flow of material and ideas to the Eurasian Steppe to the east. One good example consists of the copper spectacle-shaped pendants, which are found in a few eastern Yamnaya contexts, but have their origin in Transylvania, where they are present before and after Yamnaya migration (CIUGUDEAN 1996; POPA 2011; PREDA 2015; FRÎNCULEASA *et al.* 2020). The earliest copper-spectacle shaped pendants were found in the areas of central north-east Europe (Jordanow/Brześć-Kujawski and Lublin-Volhynia cultures), primarily in funerary contexts (MATUSCHIK 1996; WILK 2018). Together with the southern Alpine group of engraved representations, which are considerably later (HARRISON – HEYD 2007; DERENNE – ARD – BESSE 2020), they represent an Old European Late Neolithic/Copper Age fashion. Several depictions of spectacle-shaped pendants have been documented on Coțofeni III pottery (CIUGUDEAN 2002; POPA 2013) (Fig. 17.3). These clearly prove that the pendants were produced and used in Transylvania prior



Fig. 18. Distribution of the spectacle-shaped copper pendants on the territory of Romania and in the Pontic-Caspian area in late 4th – 3rd millennium BC: 1. Dobrovody, 2. Krivaya Luka, 3. Ilekhshar, 4. Blejoi, 5. Ploiești, 6. Șoimești, 7. Ariceștii-Rahtivani, 8. Ampoița, 9. Mada, 10. Poiana Aiudului, 11. Livezile, 12. Transylvania (unknown location). The location of the Sion stella in the Alps (13) is also represented on the map

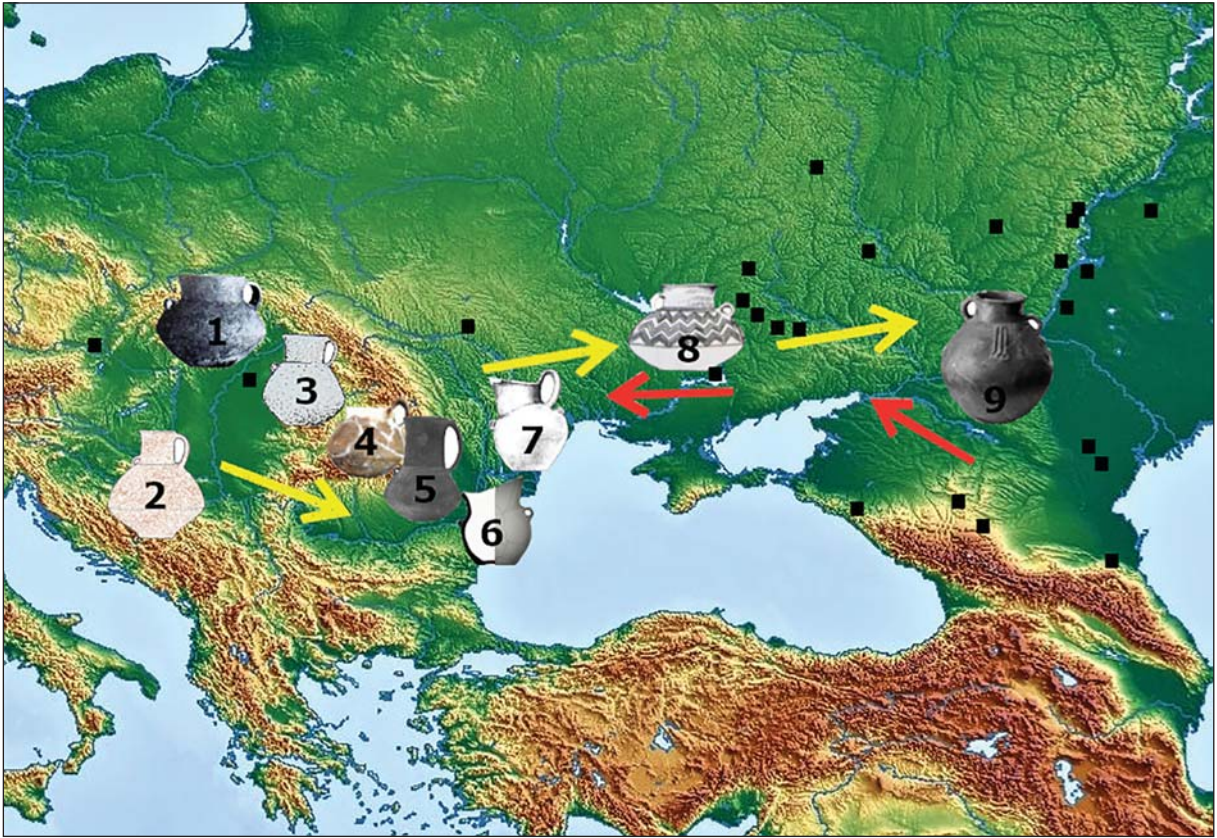


Fig. 19. Selected distribution of the EBA vessels with asymmetrical handles in southeast Europe and Pontic-Caspian area: 1. Tarnazsadány, 2. Vinkovci, 3. Izbuca Topliței, 4. Cașolț, 5. Budureasca, 6. Casimcea, 7. Matroška, 8. Sofievka, 9. Remontnoe (The yellow arrows indicate the direction of diffusion for the vessels with asymmetrical handles; the black dots indicate the finds of Manych-type daggers according to ZIMMERMANN 2003; the red arrows indicate the direction of diffusion of the daggers)

to the end of 4th millennium BC. Copper spectacle-shaped pendants were included as grave goods in a considerable number of EBA mounds in Transylvania, such as Ampoita, Poiana Aiudului, Livezile and Mada (CIUGUDEAN 1996; POPA 2011; PREDA 2015; FRÎNCULEASA *et al.* 2020) (Fig. 18). Outside the Transylvanian region, there are four other Romanian sites where spectacle-shaped pendants were found in funerary contexts: Ploiești-Triaj, Blejoi, Ariceștii-Rahtivani and Șoimești (PREDA 2015; FRÎNCULEASA *et al.* 2020; FRÎNCULEASA 2021) (Fig. 1). The Șoimești grave was radiocarbon dated between 2891–2679 cal BC (calibrated 2 sigma), which is contemporaneous with the Livezile horizon of the burials at Meteș (Fig. 12).

Copper spectacle-shaped pendants in the tumulus burials at Dobrovody (BUNYATYAN – NIKOLOVA 2010), Krivaya Luka (SHISHLINA 2008) and Ilekhshar (TKAČEV 2013) (Fig. 18) are examples of a copper ornament of Carpathian origin spreading through eastern nomadic societies.¹⁴ It should be noted that the radiocarbon dates available for part of these finds place them after 2500 BC (SHISHLINA *et al.* 2007), in what it is usually called the late Yamnaya/Katacombnya horizon (RASSAMAKIN 2011; 2013; KAISER 2019). At the same time, Manych-type daggers expanded to the west (ZIMMERMANN 2003), one of the most western examples being the piece found in grave 7-7a at Sárretudvari-Órhalom (DANI

¹⁴ Most of the Romanian archaeologists support this idea (PREDA 2015; FRÎNCULEASA 2021), but there are also those who hold an opposing opinion, who contest the Carpathian origin of such finds (GOGÂLTAN 2016).

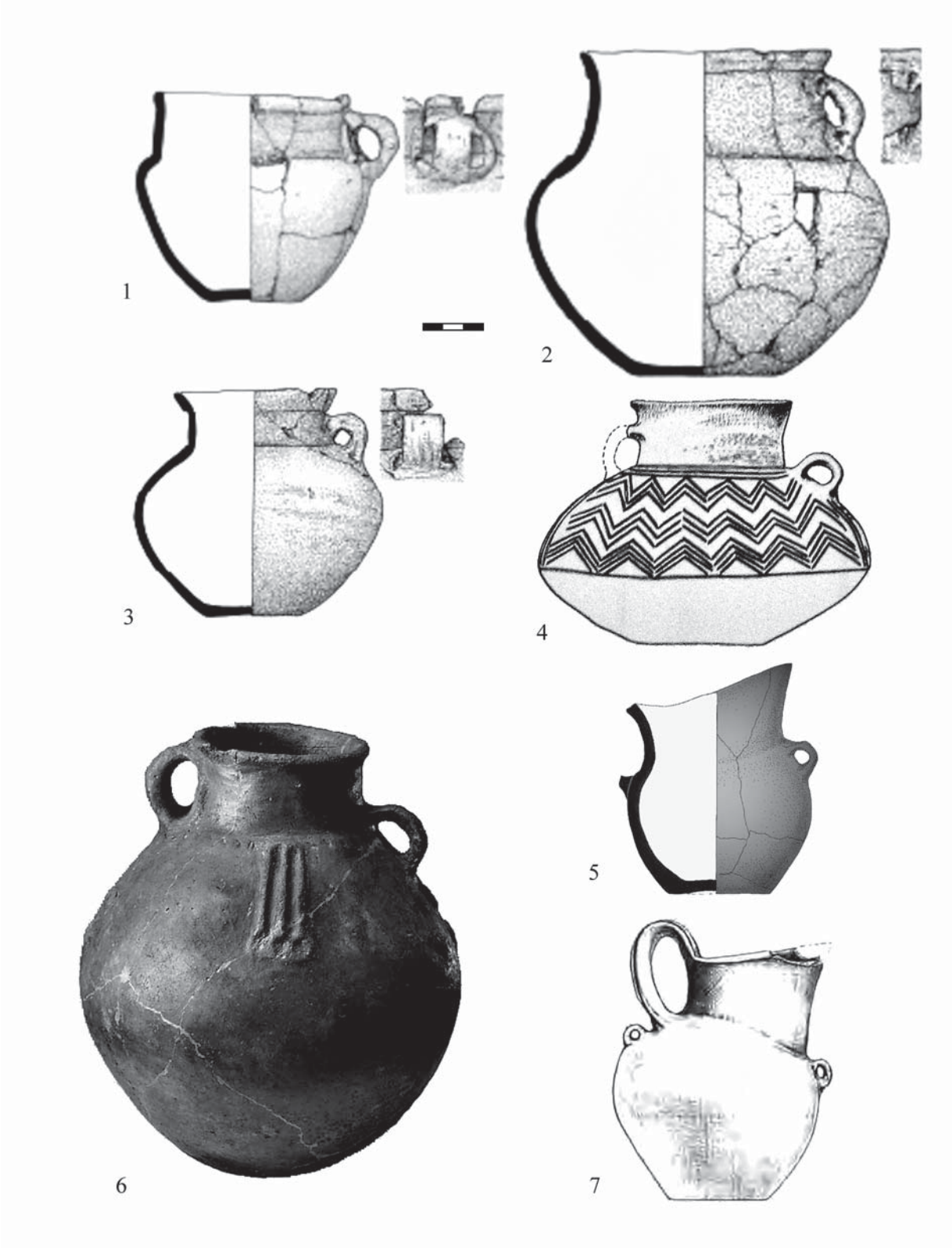


Fig. 20. Vessels with manchette-like rims from the Baga-Burul cemetery (1-3) and vessels with asymmetrical handles from Sofievka (4), Casimcea (5), Remontnoe (6); and Matroska (7) (after IVANOVA 2013; VASILIU – MOCANU – PARASCHIV 2014; SHISHLINA 2013; GHEMIS et al. 2020)

– NEPPER 2006) (*Fig. 19*). This is clearly a later burial, closer to the middle of the 3rd millennium BC, according to the calibrated date (DANI – KULCSÁR 2021). These lines of evidence illustrate a two-way trade and possible exchange of gifts between the late Yamnaya/Katacombnya immigrants and the local population. The mound from Smeeni, as well as other discoveries, has offered solid evidence that a few Katacombnya groups reached the Lower Danube area (FRÎNCULEASA *et al.* 2017, 138–151).

There is also evidence for the movement eastward of EBA Carpathian ceramics towards the Pontic and North Caucasian steppe tribes (RASSAMAKIN – NIKOLOVA 2008; KAISER 2013; 2019, 244–245; IVANOVA 2013, 95; FRÎNCULEASA 2021, 177–180). In particular, the import or imitation of vessels with asymmetrical handles illustrates the long and strong influences coming from the Carpathian-Balkan area towards the EBA steppe societies (RASSAMAKIN – NIKOLOVA 2008). The distribution of this ceramic type (*Fig. 19*) includes finds from Casimcea (VASILIU – MOCANU – PARASCHIV 2014), Matroska (IVANOVA 2013), Sofievka (RASSAMAKIN – NIKOLOVA 2008), and, probably the most eastern one, the Ulan 4 cemetery at Remontnoe (SHISHLINA 2013) (*Fig. 20.4–7*). Not far from it, the West-Manych tumulus-burials at Baga-Burul delivered an impressive number of ceramic vessels with Carpathian-Balkan shapes and patterns, including the over-turned (*manchette*) rims (SHISHLINA – GAK – SAMOILENKO 2010) (*Fig. 20.1–3*). Influences of the Glina III – Schneckenberg ceramics in the late Yamnaya horizon from the southern Bug – Ingulets rivers area have already been proposed (SHAPOSHNIKOVA – FOMENKO – DOVZHENKO 1986), and even if the cultural denomination is not the correct one, it is related to the same phenomenon.

The transfer of the cross footed bowls decorated inside from south-eastern Europe to the Yamnaya culture represents another important indicator of a west to east vector of exchange, despite the fact that the archaeological literature mainly highlights the exchange moving in the opposite direction. KAISER (2013) suggested that the interior decorated bowls of the Vucedol culture and contemporaneous cultures of southeastern Europe served as a model in the construction of the censers of the Yamnaya culture in the Dniepr region. Although Kaiser is cautious to ascertain the extent to which the production of censers in the Katacombnya culture is the result of an influence from the southeastern European cultures, the imitation of other types of vessels, as in the examples we previously presented, provides strong support for such a theory.

Conclusion

The archaeological record of Transylvania during the Late Copper Age and EBA is evidence of a dynamic context of migration, interaction, social change, and continuity. While the effect of the spread of Yamnaya from Eurasian Steppe towards the west has been a major focus of archaeological research, in this study we hope to highlight the need to take a more nuanced perspective. Within Transylvania and the Carpathian Basin, the introduction of Yamnaya ideas did not necessarily result in the full abandonment of Early Bronze Age traditions or the replacement of local populations with newcomers. Instead, local communities responded and shifted some practices, while maintaining a strong connection to their ancestry through the reuse and repurposing of space. As in any dynamic social context, Yamnaya and their descendant communities adopted and moved things and ideas from the west to the east. In light of the data presented here, we argue that a more complex view of the Yamnaya migration is needed.

References

AGULNIKOV, S. M. – POPOVICH, S. S. 2010

Demembration Rite in Yamnaya Culture from the Area between Dniester and Pruth Rivers. *Problems of Protection and Study of Archaeological Monuments of the Steppe Zone of Eastern Europe*. Luhansk 2010, 323–345.

AILINCĂI, S.-C. – MIHAIL, F – CAROZZA, L. – CONSTANTINESCU, M. – SOFICARU, A. – MICU, C. 2014

Une découverte funéraire du début de l'Age de Bronze en Dobroudja (sud-est de Roumanie). Le tumulus de Rahman (com. Casimcea, dep. Tulcea). *Prilozi Instituta za arheologiju u Zagrebu* 31 (2014) 73–88.

ALEXANDROV, S. 2018

Rannata i sredna bronzova epoha v balgarskite zemi: hronologia, periodizatsia, kulturni kontakti i nahodki ot blagorodni metali / The Early and Middle Bronze Age in Bulgaria: Chronology, periodization, cultural contacts and precious metal finds. In: Alexandrov, S. – Dimitrova, Y. – Popov, H. – Horejs, B. – Chukalev, K. (eds.): *Metals, Technologies and Interregional Contacts in the Eastern Balkans during the Bronze Age*. Sofia 2018, 85–95.

ALEXANDROV, S. 2021

Fourth/third millennium BC barrow graves in North-East Bulgaria (120 years of investigations). In: Heyd, V. – Kulcsár, G. – Preda-Bălănică, B. (eds.): *Yamnaya Interactions: Proceedings of the International Workshop held in Helsinki, 25–26 April 2019*. The Yamnaya Impact on Prehistoric Europe, vol. 2. Budapest 2021, 271–314.

ALEXANDROV, S. – KAISER, E. 2016

The Early Barrow Graves in West Pontic Area. Cultures? Migrations? Interactions? In: Nikolov, V. – Schier, W. (eds.): *Der Schwarzmeerraum vom Neolithikum bis in die Früheisenzeit (6000 – 600 v.Chr.): Kulturelle Interferenzen in der zirkumpontischen Zone und Kontakte mit ihren Nachbargebieten*. Prähistorische Archäologie in Südosteuropa 30. Rahden 2016, 449–466.

ALLENTOFT, M. E. – SIKORA, M. – SJÖGREN, K.-G. – RASMUSSEN, S. – RASMUSSEN, M. – STENDERUP, J. et al. 2015

Population Genomics of Bronze Age Eurasia. *Nature* 522 (2015) 167–172.

ANTHONY, D. W. 2007

The Horse, the Wheel, and Language: Language: How Bronze Age riders from the Eurasian Steppes shaped the modern world. Princeton 2007.

ANTHONY, D. W. 2021

Early Yamnaya chronology and origins from an archaeological perspective. In: Heyd, V. – Kulcsár, G. – Preda-Bălănică, B. (eds.): *Yamnaya Interactions: Proceedings of the International Workshop held in Helsinki, 25–26 April 2019*. The Yamnaya Impact on Prehistoric Europe, vol. 2. Budapest 2021, 15–46.

ANTHONY, D. W. – RINGE, D. 2015

The Indo-European Homeland from Linguistic and Archaeological Perspectives. *Annual Review of Linguistics* 1 (2015) 199–219.

ARAVANTINOS, V. – PSARAKI, K. 2011

Tumuli over Dwellings. The Transformation of Domestic Space to Community Monument at EH II Thebes, Greece. In: Borgna, E. – Müller-Celka, S. (eds.): *Ancestral Landscapes: Burial Mounds in the Copper and Bronze Ages (Central and Eastern Europe – Balkans – Adriatic – Aegean, 4th–2nd millennium B.C.) Proceedings of the International Conference held in Udine, May 15th–18th 2008*. Maison de l'Orient et de la Méditerranée 58. Lyon 2011, 401–413.

BĂJENARU, R. 1998

Discuții privind cronologia absolută a culturii Glina. *SCIIVA* 1/49 (1998) 3–22.

BĂJENARU, R. 2010

About the Terminology and Periodization of the Early Bronze Age in the Carpathian-Danube Area. In: Bolohan, N. – Mățău, F. – Tencariu, F. A. (eds.): *Signa Praehistorica. Studia in honorem magistri Attila László septuagesimo anno*. Iași 2010, 211–220.

BĂJENARU, R. 2014

Sfârșitul Bronzului timpuriu în regiunea dintre Carpați și Dunăre. Cluj-Napoca 2014.

BÁTORA, J. 2021

Infiltration of Yamnaya culture into the north-Carpathian region – Assessing our preliminary knowledge. In: Heyd, V. – Kulcsár, G. – Preda-Bălănică, B. (eds.): *Yamnaya Interactions: Proceedings of the International Workshop held in Helsinki, 25–26 April 2019*. The Yamnaya Impact on Prehistoric Europe, vol. 2. Budapest 2021, 361–381.

BECK, J. – CIUGUDEAN, H. – QUINN, C. P. 2020

Bioarchaeology and mountain landscapes in Transylvania's Golden Quadrangle. *Bioarchaeology International* 4 (2020) 89–110.

BECKER, C. 1999

Domesticated and wild animals as evidenced in the Eneolithic-Bronze Age cultures Coțofeni and Monteoru, Romania. In: Benecke, N. (ed): *The Holocene History of the European Vertebrate Fauna. Modern Aspects of Research*. Archäologie in Eurasien, 6. Berlin 1999, 91–105.

BERETEU, D. – ROTEA, M. 2022

Grupul Copăceni. II. Cluj-Napoca 2009.

BERTEMES, F. – HEYD, V. 2002

Der Übergang Kupferzeit/Frühbronzezeit am Nordwestrand des Karpatenbeckens: Kulturgeschichtliche und paläometallurgische Betrachtungen. In: Bartelheim, M. – Krause, R. – Pernicka, E. (eds.): *Die Anfänge der Metallurgie in der Alten Welt, Euroseminar Freiberg/Sachsen, 18–20. November 1999*. Forsch. Archäometrie u. Altwiss. 1. Rahden/Westf. 2020, 185–229.

BERTEMES, F. – HEYD, V. 2015

2200 BC – Innovation or Evolution? The genesis of the Danubian Early Bronze Age. In: Meller, H. – Arz, W. H. – Jung, R. – Risch, R. (eds.): *2200 BC – A climatic breakdown as a cause for the collapse of the old world? 7th Archaeological Conference of Central Germany. October 23–26, 2014 in Halle (Saale)*. Tagungen des Landesmuseums für Vorgeschichte Halle 12. Halle (Saale) 2015, 561–578.

BINDEA, D. 2005

Fauna culturii Coțofeni din Transilvania. *Marmatia* 8/1 (2005) 57–70.

BONDÁR, M. 2015

The Late Copper Age Cemetery at Pilismarót-Basaharc. István Torma's Excavations (1967, 1969–1972). Archaeolingua. Budapest 2015.

BONDÁR, M. 2019

A késő rézkori fémművesség magyarországi emlékei. Budapest 2019.

BULATOVIĆ, A. – GORI, M. – VANDER LINDEN, M. 2020

Radiocarbon Dating the 3rd Millennium BC in the central Balkans: a Re-examination of the Early Bronze Age Sequence. *Radiocarbon* 62/5 (2020) 1163–1191.

BUNYATYAN, K. P. – NIKOLOVA, A. V. 2010

Kurhany yamnoyi kul'tury na trypil's'kykh poselennyakh Dobrovody i Tal'yanky/Barrows of Yamna Culture at Trypillian Settlements of Dobrovody and Talyanky. *ADIU* 3 (2010) 34–50.

BURMEISTER, S. 2000

Archaeology and Migration: Approaches to an Archaeological Proof of Migration. *Current Anthropology* 41 (2000) 539–567.

BURMEISTER, S. 2017

The Archaeology of Migration: What Can and Should It Accomplish? In: Meller, H. – Daim, F. – Krause, J. – Risch, R. (eds.): *Migration und Integration von der Urgeschichte bis zum Mittelalter*. Halle 2017, 57–68.

BURTĂNESCU, F. 2002

Epoca timpurie a bronzului între Carpați și Prut cu unele contribuții la problemele epocii bronzului în Moldova. Biblioteca Thracologica XXXVII. București 2002.

CIUGUDEAN, H. 1977

Noi contribuții la cercetarea necropolelor tumulare din Munții Trascăului și ai Bedeleului. *Acta Musei Napocensis* 14 (1977) 43–56.

CIUGUDEAN, H. 1986

Grupul tumular Bedeleu și câteva considerații privind epoca timpurie a bronzului în vestul Transilvaniei. *Apulum* 23 (1986) 67–82.

CIUGUDEAN, H. 1991

Zur frühen Bronzezeit in Siebenbürgen im Lichte der Ausgrabungen von Ampoița, jud. Alba. *Prähistorische Zeitschrift* 66 (1991) 79–114.

CIUGUDEAN, H. 1995

The Later Eneolithic/Early Bronze Age tumulus-burials in central and south-western Transylvania (I). *Apulum* 32 (1995) 13–32.

CIUGUDEAN, H. 1996

Epoca timpurie a bronzului în centrul și sud-vestul Transilvaniei. București 1996.

CIUGUDEAN, H. 1997

The Later Eneolithic/Early Bronze Age tumulus-burials in central and south-western Transylvania (II). *Apulum* 34 (1997) 43–47.

CIUGUDEAN, H. 2000

Eneoliticul final în Transilvania și Banat: Cultura Coțofeni. Timisoara 2000.

CIUGUDEAN, H. 2002

The Copper Metallurgy in the Coțofeni Culture. *Apulum* XXXIX (2002) 95–106.

CIUGUDEAN, H. 2011

Mounds and mountains: Burial rituals in Early Bronze Age Transylvania. In: Berecki, S. – Németh, R. – Rezi, B. (eds.): *Bronze Age Rites and Rituals in the Carpathian Basin: Proceedings of the International Colloquium from Târgu Mureș, 8–10 October 2010*. Târgu Mureș 2011, 21–57.

CIUGUDEAN, H. 2013

Preistoria și protoistoria. In: Moga, V. – Rustoiu, G. T. (eds.): *Județul Alba. Istorie, cultură, civilizație*. Alba Iulia 2013, 13–31.

CIUGUDEAN, H. 2015

Contacte între cultura Amforelor Sferice și comunitățile Coțofeni în spațiul transilvan. *Buridava* XII/1 (2015) 164–175.

CIUGUDEAN, H. 2021

Epoca bronzului în Transilvania: o privire de ansamblu. *Apulum* LVIII (2021) 55–96.

CIUGUDEAN, H. – ROMAN, C. – DIACONESCU, D. – LUCA, S. A. 2005

Nivelul VI. Cultura Coțofeni. In: Luca, S. A. – Roman, C. – Diaconescu, D. – Ciugudean, H. – El Susi, G. – Beldiman, C. (eds.): *Cercetări arheologice în peștera Cauce (II)*. București 2005, 9–40.

DANI, J. 2020

Kurgans and their builders. The Great Hungarian Plain at the dawn of the Bronze Age. *Hungarian Archaeology* 9 (2020) 1–20.

DANI, J. – NEPPER, I. M. 2006

Sárrétudvari- Örhalom Tumulus Grave from the Beginning of the Early Bronze Age in eastern Hungary. *Communicationes Archaeologicae Hungariae* (2006) 29–63.

DANI, J. – KULCSÁR, G. 2021

Yamnaya interactions in the Carpathian Basin. In: Heyd, V. – Kulcsár, G. – Preda-Bălănică, B. (eds.): *Yamnaya Interactions: Proceedings of the International Workshop held in Helsinki, 25–26 April 2019*. The Yamnaya Impact on Prehistoric Europe, vol. 2. Budapest 2021, 329–360.

DERENNE, E. – ARD, V. – BESSE, M. 2020

Pottery as a revealer of cultural and symbolic shifts: Funerary and ritual practices in the Sion ‘Petit-Chasseur’ megalithic necropolis (3100–1600 BC, Western Switzerland). *Journal of Anthropological Archaeology* 58 (2020) 101170.

DIACONESCU, D. 2020

Step by Steppe: Yamnaya Culture in Transylvania. *Prähistorische Zeitschrift* 95/1 (2020) 17–47.

DIACONESCU, D. – TINCU, S. 2016

Considerații arheologice privind necropola tumulară de la Silvașu de Jos-Dealul Țapului (oraș Hațeg, jud. Hunedoara). *Analele Banatului* XXIV (2016) 107–141.

DUMITRAȘCU, S. – TOGAN, G. 1971

Săpăturile arheologice de la Boarta-”Cetățuie” (jud. Sibiu). *Acta Musei Napocensis* 8 (1971) 423–438.

ECSEDY, I. 1985

Öskori leletek Dunaszekcső-Várhegyről. *JPME* 29 (1985) 89–125.

FERENCZI, I. 1997

Észrevételek az Erdélyi rézkor Keleti népi és műveltségi elemeivel kapcsolatban. Szolnok 1997.

FRIEMAN, C. J. – HOFMANN, D. 2019

Present pasts in the archaeology of genetics, identity, and migration in Europe: a critical essay. *World Archaeology* 51 (2019) 528–545.

FRÎNCULEASA, A. 2020a

Earthen burial mounds and the Coțofeni Culture south of the Carpathians: The archaeological research in Ariceștii-Rahtivani – Movila pe Răzoare. *Ziridava* 34 (2020) 35–89.

FRÎNCULEASA, A. 2020b

Cultura Cernavodă II la Dunărea Inferioară. Relevanța cronologiei și a înmormântărilor tumulare. *Studii de Preistorie* 17 (2020) 135–193.

FRÎNCULEASA, A. 2021

Burial mounds in the Lower Danube region – From the international to the local and the other way round. In: Heyd, V. – Kulcsár, G. – Preda-Bălănică, B. (eds.): *Yamnaya Interactions: Proceedings of the International Workshop held in Helsinki, 25–26 April 2019*. The Yamnaya Impact on Prehistoric Europe, vol. 2. Budapest 2021, 173–205.

FRÎNCULEASA, A. – PREDA, B. – NICA, T. – SOFICARU, A. 2014

Un nou tumul preistoric cercetat la Ariceștii-Rahtivani (jud. Prahova). *Studii de Preistorie* 11 (2014) 189–227.

FRÎNCULEASA, A. – PREDA, B. – HEYD, V. 2015

Pit-graves, Yamnaya and kurgans along the Lower Danube: Disentangling 4th and 3rd millennium BC burial customs, equipment and chronology. *Praehistorische Zeitschrift* 90/1–2 (2015) 45–113.

FRÎNCULEASA, A. – SIMALCSIK, A. – PREDA, B. – GARVĂN, D. 2017

Smeeni-Movila Mare: Monografia unui sit arheologic regăsit. Editura Cetatea de Scaun. Târgoviște 2017.

FRÎNCULEASA, A. – GARVĂN, D. – MĂRGĂRIT, M. – BĂLĂȘESCU, A. – LAZĂR, I. – FRÎNCULEASA, M. N. et al. 2020

Between worlds and elites at the beginning of the Early Bronze Age in the Lower Danube Basin: a pluridisciplinary approach to personal ornaments. *Archaeological and Anthropological Sciences* 12/213 (2020) 1–18.

FURHOLT, M. 2021

Mobility and Social Change: Understanding the European Neolithic Period After the Archaeogenetic Revolution. *Journal of Archaeological Research* 29 (2021) 481–535.

FURHOLT, M. – SZMYT, M. – ZASTAWNY, A. 2008

The Baden Complex and the outside World. Studien zur Archäologie in Ostmitteleuropa, Band 4. Bonn 2008.

GERLING, C. – CIUGUDEAN, H. 2013

Insights into the Transylvanian Early Bronze Age using strontium and oxygen isotope analyses: A pilot study. In: Heyd, V. – Kulcsár, G. – Szeverényi, V. (eds.): *Transitions to the Bronze Age: Interregional Interaction and Socio-Cultural Change in the Third Millennium BC Carpathian Basin and Neighboring Regions*. Budapest 2013, 181–202.

GERLING, C. – BÁNFFY, E. – DANI, J. – KÖHLER, K. – KULCSÁR, G. – PIKE, A. W. G. et al. 2012

Immigration and transhumance in the Early Bronze Age Carpathian Basin: the occupants of a kurgan. *Antiquity* 86 (2012) 1097–1111.

GHEMIȘ, C. – ROTEA, M. – PALINCAȘ, N. – SAVA, T. B. 2020

The Graves of the Roșia Group from the Izbucu Topliței Cave: A first Assessment of their Absolute Chronology. *ArheoVest* VIII/1 (2020) 89–108.

GIMBUTAS, M. 1961

Notes on the chronology and expansion of the Pit- Grave culture. In: Bohm, J. – de Laet, S. J. (eds.): *L'Europe a la fin de l'Age de Pierre*. Prague 1961, 193–200.

GOGÂLTAN, F. 2015

The Early and Middle Bronze Age Chronology on the Eastern Frontier of the Carpathian Basin: Revisited after 15 Years. In: Németh, R. E. – Rezi, B. (eds.): *Bronze Age Chronology in the Carpathian Basin. Proceedings of the International Colloquium from Târgu Mureș 2-4 October 2014*. Cluj-Napoca 2015, 53–95.

GOGÂLTAN, F. 2016

Die Beziehungen zwischen Siebenbürgen und dem Schwarzmeerraum in der Kupfer- und am Anfang der Bronzezeit (cca. 3500-cca. 2500 v. Chr.). In: Nikolov, V. – Schier, W. (eds.): *Der Schwarzmeerraum vom Neolithikum bis in die Früheisenzeit [6000–600 v.Chr.]: Kulturelle Interferenzen in der zirkumpontischen Zone und Kontakte mit ihren Nachbargebieten*. Rahden/Westf 2016, 417–448.

GOGÂLTAN, F. 2021

Transylvania: Within or outside of the Yamnaya world? In: Heyd, V. – Kulcsár, G. – Preda-Bălănică, B. (eds.): *Yamnaya Interactions: Proceedings of the International Workshop held in Helsinki, 25–26 April 2019*. The Yamnaya Impact on Prehistoric Europe, vol. 2. Budapest 2021, 243–270.

GOGÂLTAN, F. – MOLNAR, Z. 2009

Locuirea Coțofeni. In: Mustață, S. – Gogâltan, F. – Cociș, S. – Ursuțiu, A. (ed.), *Cercetări arheologice preventive la Florești-Polus Center, jud. Cluj (2007)*. Cluj-Napoca 2009, 27–202.

HAAK, W. – LAZARIDIS, I. – PATTERSON, N. – ROHLAND, N. – MALLICK, S. – LLAMAS, B. et al. 2015

Massive Migration from the Steppe Was a Source for Indo-European Languages in Europe. *Nature* 522 (2015) 207–211.

HARDING, A. – KAVRUK, V. 2013

Explorations in Salt Archaeology in the Carpathian Zone. Archaeolingua. Budapest 2013.

HARRISON, R. – HEYD, V. 2007

The Transformation of Europe in the Third Millennium BC: the example of 'Le Petit-Chasseur I + III' (Sion, Valais, Switzerland). *Prähistorische Zeitschrift* 82 (2007) 129–214.

HEYD, V. 2011

Yamnaya Groups and Tumuli West of the Black Sea. In: Borgna, E. – Müller-Celka, E. (eds.): *Ancestral Landscapes: Burial Mounds in the Copper and Bronze Ages (Central and Eastern Europe – Balkans – Adriatic – Aegean, 4th-2nd millennium BC)*. *Proceedings of the International Conference held in Udine, May 15th-18th 2008*. Maison de l'Orient et de la Méditerranée 58. Lyon 2011, 535–555.

HORVÁTH, T. 2009

The intercultural connections of the Baden "culture". *ΜΩΜΟΣ* VI (2009) 101–149.

HORVÁTH, T. – SVINGOR, S. E. – MOLNAR, N. 2008

New radiocarbon dates for the Baden culture. *Radiocarbon* 50/3 (2008) 447–458.

HORVÁTH, T. – DANI, J. – PETŐ, A. – POSPIESZNY, L. – SVINGOR, E. 2013

Multidisciplinary Contributions to the Study of Pit Grave Culture Kurgans of the Great Hungarian Plain. In: Heyd, V. – Kulcsár, G. – Szeverényi, V. (eds.): *Transitions to the Bronze Age: Interregional Interaction and Socio-Cultural Change in the Third Millennium BC Carpathian Basin and Neighboring Regions*. Budapest 2013, 153–180.

IVANOVA, S. 2013

Kulturno-istoricheskie kontakty naseleniya Severo-Zapadnogo Prichernomoria v rannem bronzovom veke: Zapad-Vostok Kulturno-istoricheskie kontakty naseleniya. *Stratum plus* 2 (2013) 158–248.

JAROSZ, P. – KOLEDIN, J. – PODSIADŁO, M. – WŁODARCZAK, P. 2021

Excavation of “Medisova Humka” in Žabalj. In: Jarosz, P. – Koledin, J. – Włodarczak, P. (eds.), *Danubian Route of the Yamnaya Culture. The Barrows of Vojvodina. The Yamnaya Impact on Prehistoric Europe*, vol. 3. Budapest 2021, 103–136.

KAISER, E. 2013

Import, Imitation and Interaction: A Critical Review of the Chronology and Significance of Cross Footed Bowls of the Third Millennium BC in Southeastern and Eastern Europe. In: Heyd, V. – Kulcsár, G. – Szeverényi, V. (eds.): *Transitions to the Bronze Age: Interregional Interaction and Socio-Cultural Change in the Third Millennium BC Carpathian Basin and Neighboring Regions*. Budapest 2013, 139–152.

KAISER, E. 2019

Das dritte Jahrtausend im osteuropäischen Steppenraum, Kulturhistorische Studien zu prähistorischer Subsistenzwirtschaft und Interaktion mit benachbarten Räumen. Topoi. Berlin 2019.

KAISER, E. – WINGER, K. 2015

Pit graves in Bulgaria and the Yamnaya Culture. *Praehistorische Zeitschrift* 90/1–2 (2015) 114–140.

KISS, V. – CSÁNYI, M. – DANI, J. – FISCHL, K. – KULCSÁR, G. – SZATHMÁRI, I. 2019

Chronology of the Early and Middle Bronze Age in Hungary: New results. *Studia Hercynia* 23/2 (2019) 173–197.

KOLEDIN, J. – BUGAJ, U. – JAROSZ, P. – NOWAK, M. – PRZYBYLA, M. – PODSIADŁO, M. et al. 2020

First archaeological investigations of barrows in Bačka region and the question of the Eneolithic/ Early Bronze Age barrows in Vojvodina. *Praehistorische Zeitschrift* 95 (2020) 350–375.

KRAUSS, R. – CIOBOTARU, D. 2013

Daten zum Ende des Badener Keramikstils und dem Beginn der Frühbronzezeit aus Foeni-Gaz im rumänischen Banat. *Praehistorische Zeitschrift* 88/1 (2013) 38–113.

KRISTIANSEN, K. – ALLENTOF, M. E. – FREI, K. M. – IVERSEN, R. – JOHANNSEN, N. N. – KROONEN, G. et al. 2017

Re-Theorising Mobility and the Formation of Culture and Language among the Corded Ware Culture in Europe. *Antiquity* 91 (2017) 334–347.

KULCSÁR, G. – SZEVEERÉNYI, V. 2013

Transition to the Bronze Age: Issues of Continuity and Discontinuity in the First Half of the Third Millennium BC in the Carpathian Basin. In: Heyd, V. – Kulcsár, G. – Szeverényi, V. (eds.): *Transitions to the Bronze Age. Interregional Interaction and Socio-Cultural Change in the Third Millennium BC Carpathian Basin and Neighbouring Regions*. Budapest 2013, 67–92.

LAZAROVICI, G. 1997

About the Early Bronze from Transylvania. *Angustia* 2 (1997) 9–36.

LICHARDUS, J. 1991

Die Kupferzeit als historische Epoche: Versuch einer Deutung. In: Lichardus, J. (ed.): *Die Kupferzeit als historische Epoche*. Bonn 1991, 763–800.

LUCA, S. A. 2012

Cercetările arheologice preventive de la Turdaș-Luncă (județul Hunedoara). Campania 2011. Bibliotheca Brukenthal LIX. Sibiu 2012.

LUCA, S. A. – DIACONESCU, D. – ROMAN, C. C. – TINCU, S. 2011

The Archaeological research from Silvașu de Jos – Dealul Țapului. The archaeological Campaigns from 2006–2010. In: Cosma, C. (ed.): *Studii de arheologie și istorie. Omagiu profesorului Nicolae Gudea la 70 de ani / Studies in archaeology and history. An anniversary volume to professor Nicolae Gudea on his 70th birthday*. Cluj-Napoca 2011, 43–76.

LYSENKO, S. D. – RAZUMOV, S. N. 2016

Demembration in the Funeral Rite of the Ingul Catacomb Culture of the Northwest Black Sea Region. *The New Past* 4 (2016) 49–66.

MARAN, J. 1998

Kulturwandel auf dem griechischen Festland und den Kykladen im späten 3. Jahrtausend v. Chr.. UPA bd. 53, I–II. Bonn 1998.

MATHIESON, I. – ALPASLAN-ROODENBERG, S. – POSTH, C. – SZÉCSÉNYI-NAGY, A. – ROHLAND, N. – MALLICK, S. et al. 2018

The Genomic History of Southeastern Europe. *Nature* 555 (2018) 197–203.

MATUSCHIK, I. 1996

Brillen- und Hakenspiralen der frühen Metallzeit Europas, *Germania* 74 (1996) 1–43.

MOTZOI-CHICIDEANU, I. 2011

Obiceiuri funerare în epoca bronzului la Dunărea mijlocie și inferioară. București 2011.

MÜLLER-CELKA, S. 2011

Burial Mounds and “Ritual Tumuli” of the Aegean Early Bronze Age. In: Borgna, E. – Müller-Celka, S. (eds.): *Ancestral Landscapes: Burial Mounds in the Copper and Bronze Ages (Central and Eastern Europe – Balkans – Adriatic – Aegean, 4th–2nd millennium B.C.)*. *Proceedings of the International Conference held in Udine, May 15th–18th 2008*. Maison de l’Orient et de la Méditerranée 58. Lyon 2011, 415–428.

NEBRAT, S. 2013

The Secondary Burials of the Catacomb Culture. *Donetsk Archeological Collection* 17 (2013) 7–23.

OTROSHCHENKO, V. V. 2013

The Catacomb Culture Phenomenon. *Baltic-Pontic Studies* 18 (2013) 21–38.

POPA, C. I. 2011

Between ornaments, social status and symbolism. Spectacle-shaped pendants of the Transylvanian Bronze Age. *Thraco-Dacica* 11 (2011) 35–46.

POPA, C. I. 2012

Contribuții la preistoria Văii Sebeșului (I). Locuiri Coțofeni din zona deluroasă. Sebeș 2012.

POPA, C. I. 2013

Motive-simbol pe vasele ceramice Coțofeni: cercuri concentrice, spirale, spirale-ochelari. *Terra Sebus* 5 (2013) 77–110.

POPA, C. I. – FAZEKAȘ, G. 2013

Contribuții la cunoașterea etapei finale a culturii Coțofeni în Crișana. *Apulum* 50 (2013) 47–85.

POPA, C. – GOGĂLTAN, F. 2014

Locuirea Coțofeni de pe grindul de la Gligorești-Holoame (jud. Cluj). Cluj-Napoca 2014.

POPA, C. I. – PLANTOS, C. – KOLBE, E. – RABSILBER, T. – DELEANU, V. – TOTOIANU, R. et al. 2006

Raport de cercetare arheologică pe șantierul Cetea–La Pietri. Campania 2005. *Patrimonium Apulense* 5–6 (2006) 181–191.

POPESCU, A. – BĂJENARU, R. 2008

Mortuary practices at Costișa (Neamt County). *Dacia* 52 (2018) 23–47.

POPESCU, A. – SOFICARU, A. D. – MĂRGĂRIT, M. 2016

Selection and manipulation of human remains during the Bronze Age: The Evidence from Costișa (Eastern Romania). In: Gogăltan, F. – Ailincăi, S. (eds.): *Settlements of Life and Death: Studies from Prehistory to Middle Ages*. Cluj-Napoca 2016, 71–88.

PREDA, B. 2015

Considerations regarding Barrow Burials and Metal Depositions during the Early Bronze Age in the Carpathian-Danube Area. *Hiperboreea Journal* 2/2 (2015) 5–51.

PREDA-BĂLĂNICĂ, B. – FRÎNCULEASA, A. – HEYD, V. 2020

The Yamnaya Impact North of the Lower Danube: A Tale of Newcomers and Locals. *Bulletin de la Société préhistorique française* 117/1 (2020) 85–101.

RACZKY, P. 2009

Historical context of the Late Copper Age cemetery at Budakalász. In: Bondar, M. – Raczky, P. (eds.): *The Copper Age Cemetery of Budakalász*. Budapest 2009, 475–484.

RASSAMAKIN, Y. 2011

Eneolithic Burial Mounds in the Black Sea Steppe. From the first Burial Symbols to Monumental Ritual Architecture. In: Borgna, E. – Müller-Celka, S. (eds.): *Ancestral Landscapes: Burial Mounds in the Copper and Bronze Ages (Central and Eastern Europe – Balkans – Adriatic – Aegean, 4th–2nd millennium B.C.)*. *Proceedings of the International Conference held in Udine, May 15th–18th 2008*. Maison de l'Orient et de la Méditerranée 58. Lyon 2011, 295–305.

RASSAMAKIN, Y. 2013

From the Late Eneolithic Period to the Early Bronze Age in the Black Sea Steppe: What is the Pit Grave Culture (Late Fourth to Mid-Third Millennium BC)? In: Heyd, V. – Kulcsár, G. – Szeverényi, V. (eds.): *Transitions to the Bronze Age. Interregional Interaction and Socio-Cultural Change in the Third Millennium BC Carpathian Basin and Neighbouring Regions*. Budapest 2013, 113–138.

RASSAMAKIN, Y. – NIKOLOVA, A. V. 2008

Carpathian Imports and Imitations in Context of the Eneolithic and Early Bronze Age of the Black Sea Steppe Area. In: Biehl, P. F. – Rassamakin, Ya. Y. (eds.): *Import and Imitation in Archaeology*. Langenweissbach 2008, 51–87.

RIȘCUȚA, N. C. 2008

Bronzul timpuriu de la epi-Coțofeni până la apariția culturii Wietenberg între Valea Mureșului și bazinul superior al Crișului Alb. Summary of PhD thesis, Universitatea Ovidius. Constanța 2008.

RIȘCUȚA, N. C. – POPA, C. I. – FERENCZ, I. V. 2009

Cercetări arheologice la Balșa și Mada (jud. Hunedoara) și câteva observații privind necropolele tumulare din Munții Apuseni. *Apulum* 46 (2009) 257–286.

RIȘCUȚA, N. C – COSAC, M. – PAVEL, R. 2012

Cercetările arheologice din peștera Prihodiște (com. Vața de Jos, jud. Hunedoara) și câteva considerații privind etapa finală a culturii Coțofeni. *Sargetia* S.N. III (2012) 59–89.

ROMAN, P. I. 1976

Cultura Coțofeni. București 1976.

ROMAN, P. I. 1986

Perioada timpurie a epocii bronzului pe teritoriul României. *Studii și Cercetări de Istorie Veche și Arheologie* 37 (1986) 29–55.

ROTEA, M. 2003

Grupul Copăceni. Cluj-Napoca 2003.

ROTEA, M. 2009

Pagini din preistoria Transilvaniei. Epoca bronzului. Cluj-Napoca 2009.

ROTEA, M. – NETEA, M. G. – DE-LA-RUA, C. – TECAR, T. – HERVELLA, M. – ALONSOS, S. et al. 2014

The archaeological context of the DNA samples collected from prehistoric sites in Transylvania. *Acta Musei Napocensis* 51/I (2014) 21–60.

SACHSSE, C. 2008

Baden Cultural Identities? Late Copper Age Funerals Reviewed. In: Furholt, M. – Szmyt, M. – Zastawny, A. (eds.): *The Baden Complex and the Outside World.* Bonn 2008, 49–68.

SCHIER, W. 2014

The Copper Age in Southeast Europe – historical epoch or typo-chronological construct? In: Schier, W. – Drașovean, F. (eds.): *The Neolithic and Eneolithic in Southeast Europe. New approaches to dating and cultural dynamics in the 6th to 4th Millennium BC.* Prähistorische Archäologie in Südosteuropa, 28. Rahden/Westf. 2014, 419–436.

SHAPOSHNIKOVA, O. G. – FOMENKO, V. N. – DOVZHENKO, N. D. 1986

Yamnaya kulturno-istoricheskaya Oblast (yuzhnobugskiy variant). Kyiv 1986.

SHISHLINA, N. I. 2008

Reconstruction of the Bronze Age of the Caspian Steppes. Life styles and life ways of pastoral nomads. British Archaeological Reports International Series 1876. Oxford 2008.

SHISHLINA, N. I. 2013

108.2. Kurgan 4, Grab 10. In: Piotrovskij, Ju. Ju. (ed.): *Bronzezeit. Europa ohne Grenzen. 4. – 1. Jahrtausend v. Chr. Ausstellungskatalog: Sankt Petersburg, Staatliche Eremitage, vom 21. Juni bis zum 8. September 2013, Moskau, Staatliches Historisches Museum, vom 15. Oktober 2013 bis zum 15. Januar 2014.* Sankt-Peterburg 2013, 415.

SHISHLINA, N. I. – VAN DER PLICHT, J. – HEDGES, R. E. M. – ZAZOVSKAYA, E. P. – SEVASTYANOV, V. S. – CHICHAGOVA, O. A. 2007

The Catacomb Cultures of the North-West Caspian Steppe: 14C Chronology, Reservoir Effect, and Paleodiet. *Radiocarbon* 49/2 (2007) 713–726.

SHISHLINA, N. I. – GAK, E. I. – SAMOILENKO, V. G. 2010

Zapadnomanychskie catacomb burial cemetery Baga-Burul in Kalmykia. *Materials and studies of the archaeology of Eastern Ukraine* 10 (2010) 142–167.

SIKLÓSI, Z. 2009

Absolute and internal Chronology of the Late Copper Age Cemetery at Budakalász. In: Bondar, M. – Raczky, P. (eds.): *The Copper Age Cemetery of Budakalász*. Budapest 2009, 458–474.

SZÉKELY, ZS. 1997

Perioada timpurie și începutul celei mijlocii a epocii bronzului în sud-estul Transilvaniei. *Bibliotheca Thracologica*, XXI. București 1997.

TELEGIN, D. Y. – PUSTOVALOV, S. Z. – KOVALYUKH, N. N. 2003

Relative and absolute chronology of Yamnaya and Katakomb monuments: the issue of co-existence. In: Koško, A. – Klochko, V. I. (eds.): *The Foundations of Radiocarbon Chronology of Cultures between the Vistula and Dnieper: 4000–1000 BC*. Baltic-Pontic Studies 12. Poznań 2003, 132–184.

TKACEV, V. 2013

Vom Ural bis zum Aralsee: Viehzüchter, Bergleute und Metallurgen des Paläometallikums (Äneolithikum - Bronzezeit). In: Stöllner, T. – Samašev, Z. (eds.): *Unbekanntes Kasachstan. Archäologie im Herzen Asiens*. Bochum 2013.

ȚUȚULESCU, I. 2016a

Perioada de tranziție spre epoca bronzului în zona deluroasă și montană a Olteniei. Târgu Jiu 2016.

ȚUȚULESCU, I. 2016b

Cultural interactions between the Coțofeni culture and surrounding cultures in Oltenia during the transition from the Eneolithic to the Bronze Age. In: Popa, C. I. (ed.): *The Carpathian Basin and the Northern Balkans between 3500 and 2500 BC: Common Aspects and Regional Differences*. Annales Universitatis Apulensis, Series Historica, 20/II. Alba Iulia 2016, 203–216.

VAJSOV, I. 2002

Das Grab 982 und die Protobronzezeit in Bulgarien. In: Todorova, H. (ed.): *Durankulak II. Die prähistorischen Gräberfelder von Durankulak*. Sofia 2002, 159–176.

VASILIU, I. – MOCANU, M. – PARASCHIV, D. 2014

Mormântul în cistă de piatră de la Casimcea. *Pontica* 47 (2014) 163–185.

VLASSA, N. – TAKÁCS, M. – LAZAROVICI, G. 1987

Die Hügelgräber aus dem Banat und aus Siebenbürgen aus der Spätäneolithischen Periode. *Symposium Donji Milanovac*. Beograd 1987, 107–119.

VULPE, A. 1975

Die Äxte und Beile in Rumänien II. PBF IX/5. München 1975.

VULPE, A. 1991

Neue Beiträge zur Chronologie und Kulturellen Gliederung der Frühbronzezeit im Unteren Donau-gebiet. *Starinar* 40–41 (1991) 105–111.

VULPE, A. 2001

Considerations upon the Beginning and the Evolution of the Early Bronze Age in Romania. In: Rainer, M. – Boehmer, R. M. – Maran, J. (eds.): *Lux Orientis. Archäologie zwischen Asien und Europa. Festschrift für Harald Hauptmann zum 65. Geburtstag*. Internationale Archäologie, Studia honoraria 12. Rahden/Westf. 2001, 419–426.

WIENCKE, M. H. 2000

Lerna. A Preclassical Site in the Argolid. The Architecture, Stratification, and Pottery of Lerna III, vol. IV. Princeton 2000.

WILD, E. M. – STADLER, P. – BONDÁR, M. – DRAXLER, S. – FRIESINGER, H. – KUTSCHERA, W. et al. 2001

New chronological frame for the young Neolithic Baden culture in Central Europe (4th Millennium BC). *Radiocarbon* 43 (2001) 1057–1064.

WILK, S. 2018

Can we talk about the Copper Age in Lesser Poland? Contribution to the discussion. In: Valde-Nowak, P. – Sobczyk, K. – Nowak, M. – Żrałka, J. (eds.): *Multas per gentes and multa per saecula*. Kraków 2018, 485–494.

WŁODARCZAK, P. 2014

The Traits of Early Bronze Pontic Cultures in the Development of old Upland Corded Ware (Małopolska groups) and Złota Culture Communities. *Baltic-Pontic Studies* 19 (2014) 7–52.

WŁODARCZAK, P. 2017

Kurgan Rites in the Eneolithic and Early Bronze Age Podolia in Light of Materials from the Ceremonial Centre at Yampil. *Baltic-Pontic Studies* 22 (2017) 246–283.

ZIMMERMANN, T. 2003

Zwischen Karpaten und Kaukasus – Anmerkungen zu einer ungewöhnlichen Kupferklinge aus Wien-Essling. *Archäologisches Korrespondenzblatt* 33 (2003) 469–477.

East European elements in burial rites of the Moravian Corded Ware Culture. Wagon burial in Moravia in the 3rd millennium BC?

JAROSLAV PEŠKA

Abstract

The generally accepted origin of the Corded Ware Complex is logically reflected in the material culture of its Central European groups, which exhibit many East European elements. The discussion about the intrusion of Yamnaya culture into the heart of Europe and its genetic legacy would thus be reflected not only in burial rites or in the social sphere, but also in material culture of Corded Ware people. Were there perhaps some direct contacts between Central Europe and the Black Sea-Caucasus region at the beginning of the 3rd millennium BC? We will try to find out, using the example of the Moravian group of Corded Ware Culture (MCWC). We are able to follow up many phenomena and elements outside the territory of Moravia, in its vicinity, both during the existence of Corded Ware culture and in the cultures existing immediately before and after this period. J. ONDRÁČEK (1965) has documented the south-eastern influences on ceramic production during the local development of MCWC. The comparison of relations to East Europe based on the defined “Yamnaya package” (HARRISON – HEYD 2007) reveals many accordances as well as differences. In addition to the earlier-known entities (individual inhumation burials under barrows, total absence or a low number of settlements, cord-ornamented pottery, bowls decorated on both inner and outer surface, stone hammer-axes, composite necklaces, etc.), typical elements of Yamnaya and Catacomb cultures appear as a novelty or in larger amounts (inner constructions in grave pits, metallurgists’ graves, clay funnels, tanged daggers and other copper industry, shaft-hole axes, crook/hammer-headed bone pins, bone tubes and the so-called pan flute, bone/metal solar discs, etc.). The most significant new finding is a concentration of MCWC graves with ruts in the bottom, whose dimensions are analogous to those in East European wagon burials (Yamnaya and Catacomb cultures). Surprisingly enough, almost identical analogies are found in a wider European territory much later, in the Hallstatt and La Tène Period elite graves. Previous calculations and reconstructions, including a surprisingly successful attempt to project a wagon model from Trialeti into the ground-plan of our grave pits, support this idea. The absence of any wagon components (except the ruts) indicates the presence of an all-wood four-wheeled ceremonial wagon used for the burial of some selected individual with no special social status, similar to those that were used within a wider Black Sea region. The confirmation of this bold hypothesis would provide another clear proof of direct contacts between the two above-mentioned regions during the 3rd millennium BC and a strong argument to support the results of accomplished archaeogenetic analyses.

Key words: Corded Ware culture, Yamnaya and Catacomb cultures, Yamnaya package, East European influences, wagon burials

Introduction

In view of the persisting and generally accepted opinion that the Corded Ware Complex originates from East Europe (BUCHVALDEK 1986; KRISTIANSEN 1989; ANTHONY 2007; WŁODARCZAK 2008; 2017;

KADROW 2008; KRISTIANSEN *et al.* 2017 and others), it is in no way surprising that the material culture of as good as all Corded Ware groups contains many East European elements (fading out in western direction). The topic of infiltration of Yamnaya culture into the heart of Europe and its genetic inscription and legacy is still being vividly discussed (BRANDT *et al.* 2013; LAZARIDIS *et al.* 2014; ALLENTOF *et al.* 2015; HAAK *et al.* 2015; MATHIESON *et al.* 2015; KRISTIANSEN *et al.* 2017; HEYD 2017; OLALDE *et al.* 2018; 2019; JURAS *et al.* 2018; FURHOLT 2019), although recent archaeogenetic analyses do not show a direct genetic link between Corded Ware and Yamnaya cultures (PAPAC *et al.* 2021). This event should be reflected somehow not only in burial rites and in the socio-economic sphere, but also in the material culture of Corded Ware people. It is to remark that the relationship between the two above-mentioned complexes (Yamnaya vs. Corded Ware) is not yet satisfactorily elucidated. Provided that there were any direct contacts with the Black Sea-Caucasus region at the turn of 4th–3rd millennia BC or at the beginning of the 3rd millennium BC: are we able to identify these contacts in the material content of Corded Ware Culture? We will try to do so on the example of the Moravian group of Corded Ware Culture (MCWC), although it is clear that many phenomena and entities did not necessarily occur in Moravia. The relations to East Europe have already been followed up on the basis of the earlier-defined “Yamnaya package” (HARRISON – HEYD 2007), so we can try to verify these connections.

Transformation and implementation of the “Yamnaya package” in the MCWC material culture

Social sphere

Tumuli and tumulus cemeteries, burial rites

An identical common feature is represented by circular barrows (group of East Moravian barrows: TUREK – PEŠKA – MATĚJČKOVÁ 2011; HEJCMAN *et al.* 2013) of simple constructions (in contrast to Yamnaya and Catacomb cultures), which are now only partly visible in terrain. The position of barrows is often indicated only by a considerable distance between individual graves (PEŠKA 2017) – in vast majority inhumation burials (cremation has been considered to originate from the Carpathian Basin) in rectangular grave pits. The supine position of the upper body with contracted lower extremities lying on the right or left side (*Rückenhocker*) is slightly predominant. The true contracted burial, where the whole body is lying on the right or left side, is relatively frequent (PEŠKA 2013, 119). The orientation of graves is quite variable and sexual differentiation is strictly observed. Funerary customs are much more complicated in the territory of East Europe. In Maykop Culture, inhumation was practiced in a contracted position on the right side, with the head turned to the north. Later (Yamnaya and Catacomb cultures), a stretched position or right-sided contracted position were practised with E–W orientation, and the so-called *Rückenhocker* or *rhombischer Hocker* are also frequent (HÄUSLER 1974; 1976; 1998; 2004). The predominant orientation in Moravia is that along the N–S axis with some deviations, including the group of East Moravian barrows (ČIŽMÁŘ – GEISLER 1998, 77–78; ŠMÍD 1998, 125; PEŠKA 2017, 32–34). The W–E axis is less frequent (Central Moravia 5.38 %, remaining territory 9.2 %, along the motorway section Brno–Vyškov 14.3 %, but the section Vyškov–Mořice only 6.25 %), similarly as in Lesser Poland (7%: WŁODARCZAK 2006, 58–63, Ryc. 35).

In the territory of Yamnaya culture, organic substances were typically used to adjust the grave pit or the burial itself, and red ochre also is a frequent phenomenon (not in Moravia). The practiced burial rite is solely inhumation, sexual differentiation is not preferred, and the W–E orientation is strictly observed (IVANOVA – TOSHCHEV 2015, Fig. 17). The frequently occurring so-called frog position probably resulted

from a supine burial with contracted lower extremities in a raised position (HÄUSLER 1974; 1976; 1998; 2004). Leaving aside the maybe still Mesolithic-Neolithic complex of Lepenski Vir and the exceptional Early Neolithic burials of “thinkers” (MANZURA 2009, Abb. 9:1,9), we meet this custom in the Yamnaya culture (Ukraine, South Russia, East Hungary) and Fatyanovo Culture; in the Central European territory, it can be detected in the Corded Ware culture (East Slovakia, South Poland), sporadically in the Bell Beaker culture (BBC) (Sandomierz) and, further on, over the Early Bronze Age (Nitra, Košťany, Únětice), exceptionally until as late as the Middle Bronze Age (Tápé: STUHLÍK 2000, 292). From the above enumeration arises that this phenomenon has occurred over more than 700–900 years (!).

In the territory of Yamnaya and Catacomb cultures, we can find much more examples of monumental tumuli, intricate constructions of grave pits with internal adjustments and wood lining, sometimes combined with anthropomorphic stelae (which are not evidenced in Moravia). Some analogies are known in the Balkans, in the Carpathian Basin, but also in the territory of Bell Beaker culture in West Europe (Spain: HEYD 2017). Anthropomorphic stelae with identical depiction of shoes/sandals occur both in the east (here already in Maykop culture – Nalchik; Yamnaya culture, Plachidol II, T. I and other) and on the Iberian Peninsula, surprisingly in the Bell Beaker culture. The distance between these parallels is 4,500 km (HEYD 2017, 354, Fig. 4). On Iberia, also important are several graves of large

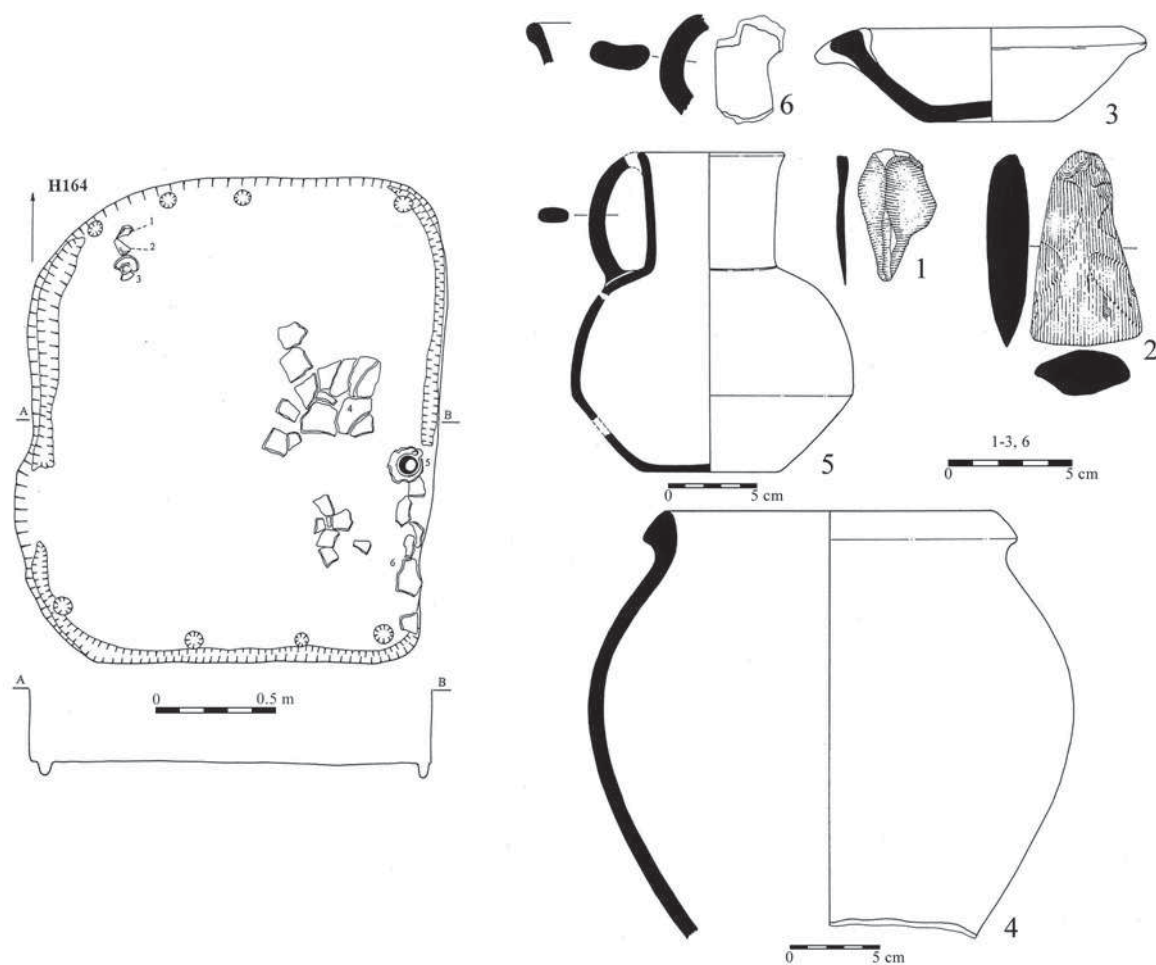


Fig. 1. Olomouc-Slavonín, Horní lán. Grave of Corded Ware Culture (H 164) with an internal wooden perimeter construction. Drawing by A. Pešková

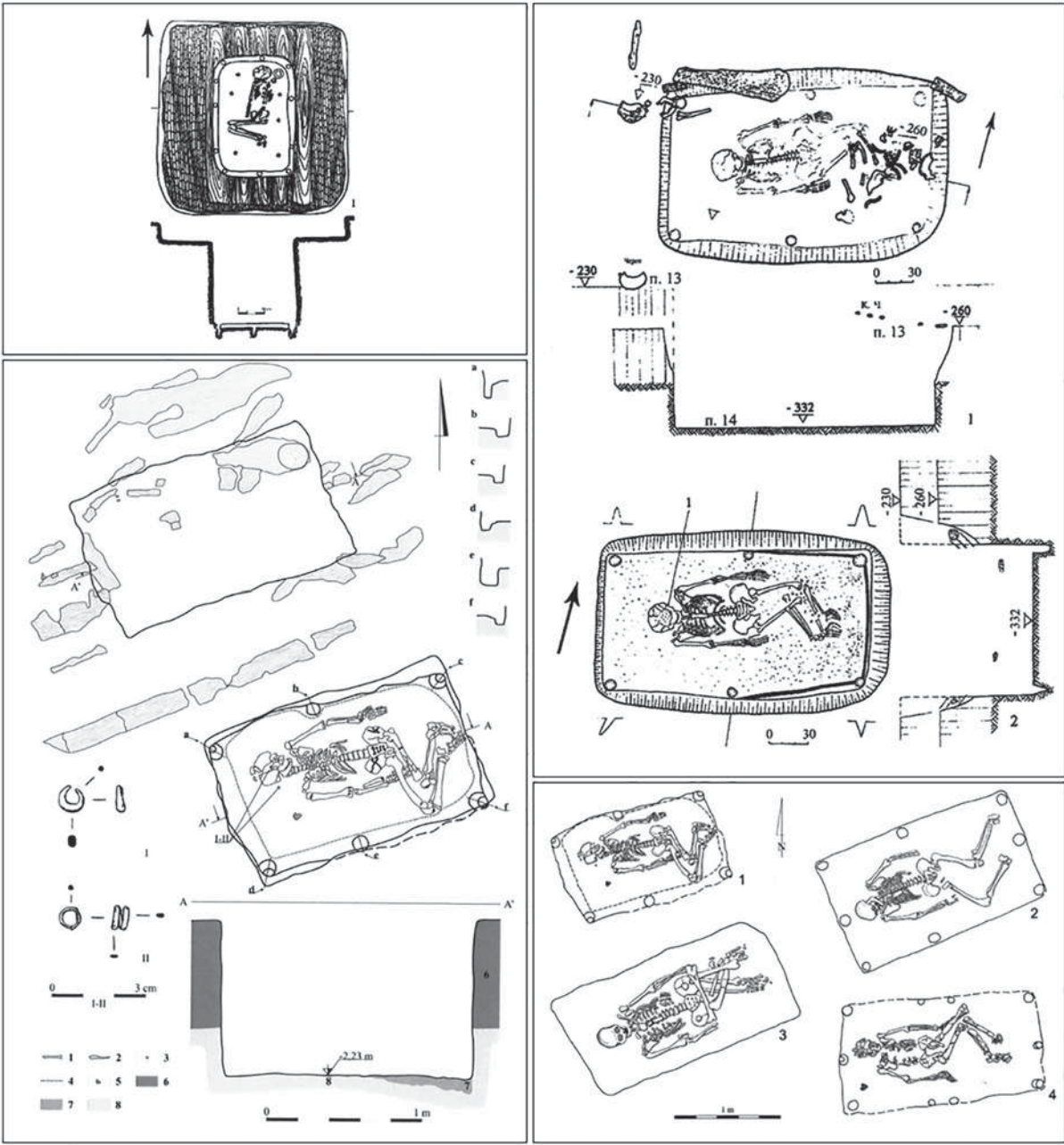


Fig. 2. Examples of internal post-built constructions in graves of Yamnaya Culture in the East European steppe region (after AGULNIKOV 2011; LARINA – MANZURA – CHACHEY 2008; WŁODARCZAK 2017)

dimensions with chambers, male burials in contracted position on the right side and E–W orientation, grave goods in the form of flint daggers and red ochre colouring (HEYD 2017, 354, Fig. 3).

The vast majority of MCWC grave pits have a simple form with flat bottom. The frequently occurring, strikingly dark fill has been explained by the infilling of the hollow space before the collapse of a wooden burial case or the ceiling (NEUSTUPNÝ – SMRŽ 1989, 326; NEUSTUPNÝ 2008, 131) with no traces of any additional construction. The description of an older find context in the grave from Vážany nad Litavou (SCHIRMEISEN 1936, 13–14), which mentions four corner posts, a wooden ceiling

with a thick layer of mouldered wood and three skeletons in non-anatomical position resting on this layer, confirms the existence of wooden burial cases. While the inner construction can be evidenced by circular postholes/stake holes in the corners of the grave pit (Boleradice, Brno-Lískovec, Podolí), the two longitudinal ruts or four oval slots in the bottom of the grave must be interpreted in a new way (see below). An example of inner construction with a combination of a perimeter groove and two opposite rows of postholes (Olomouc-Slavonín, Horní lán H 164) is unique so far. It can be reconstructed as a complete inner wood lining of a grave pit (*Fig. 1*), which has analogies in the Yamnaya and Catacomb cultures (*Fig. 2*; HÄUSLER 1974, Taf. 32:3; SZMYT 2009, Fig. 6:B; IVANOVA – TOSHCHEV 2015, Fig. 18:8,12; 20:4; 22:2,3; WŁODARCZAK 2017, Fig. 13; KOLEDIN *et al.* 2020 and many others). Seen from a wider perspective, such constructions are associated with the so-called houses of the dead (*Totenhäuser* – true houses of the dead should exhibit traces of an external construction), which occur in our territory more frequently during the Early Bronze Age (BÁTORA 1999; PEŠKA – TAJER 2007). The circular ditches around the graves might also represent an analogous feature. These structures are relatively frequently observed with tumuli in East Europe (KAISER 2003, Taf. 10; 21; 24; IVANOVA 2013, Fig. 3:1), but also e.g. in the Balkan-Carpathian region (FRÎNCULEASA *et al.* 2019, Fig. 3; KOLEDIN *et al.* 2020). We can find them so far only sporadically in MCWC in Moravia (Holubice VII, Babice u Šternberka), more frequently in Bohemia (6×). The frequency in BBC is exactly the opposite, with a culmination in the Csepel Group in Hungary (ENDRÖDI 2013, Fig. 7, 9; PATAY 2013; CZENE 2017; PEŠKA 2022).

Wagon burials?

The group of graves with two ruts or four longitudinal slots in the bottom, with a clear concentration in Central Moravia (*Figs. 3–4*), were so far interpreted as graves with inner construction (cf. PEŠKA 2002; 2013, 117–119, obr. 72; 2017, 24; 2021). But it gradually turns out that these finds should be rather interpreted as wagon burials (!), of whom we know sufficient examples in the territory of Yamnaya and Catacomb cultures in the whole Black Sea region as far as the North Caucasus (over 250 graves in the Pontic-Caspian region: PIGGOTT 1983; REINHOLD *et al.* 2017; most recently KAISER 2019, 23 ff.), with an “offshoot” in the western Black Sea region south of the Caucasus (Ananauri T. 3, Bedeni Culture, 1st half of 24th century BC: MAKHARADZE 2016) and later e.g. in South Russia (Sintashta: LICHARDUS – VLADÁR 1996; PARZINGER 2010; 2000–1800 BC). In the Late Funnel Beaker culture at the turn of the 4th–3rd millennia BC, traces of wagons were found in the cemetery of Vestrup in Northwest Jutland (JOHANSEN – NIELSEN – JENSEN 2016, Fig. 7a, 7b). The traces of a wagon under the mantle of a long barrow at Flintbek from the same cultural sphere in North Germany (MISCHKA 2011) are even older (ca. 3400 BC). The two animal burials from Profen (Central Germany; 3300–3000 BC: FRIEDERICH – HOFFMANN 2013) are interpreted as the burial of a team of two draught animals with a wagon.

The difference here is that in the East European steppe region often directly the wooden components of wagons are preserved and a minimum of ruts (wheel slots), whereas in Moravia these wheel slots (*Fig. 5*) represent so far the only evidence of this type of burials. Another interesting fact is that in Moravia we find surprisingly identical analogies to these ruts much later, in the Hallstatt Period elite graves (KOS 2011; KOS – PŘICHYSTAL 2013; MÍROVÁ – GOLEC 2018, 58–62; MÍROVÁ 2019, 70 ff.). Similar wheel slots are also found in the Hallstatt and La Tène Period elite graves in a wider European territory (PARE 1992; LAMBOT 2018), but these traces mostly belong to two-wheeled chariots. Previous calculations and reconstructions of types and dimensions of four-wheeled wagons, which were published in professional literature, instigated us to make an attempt to project a wagon model (Trialeti) into the ground-plans of our CWC grave pits. This attempt was (in almost all cases) surprisingly successful, which supports the idea mentioned above (*Fig. 6*).

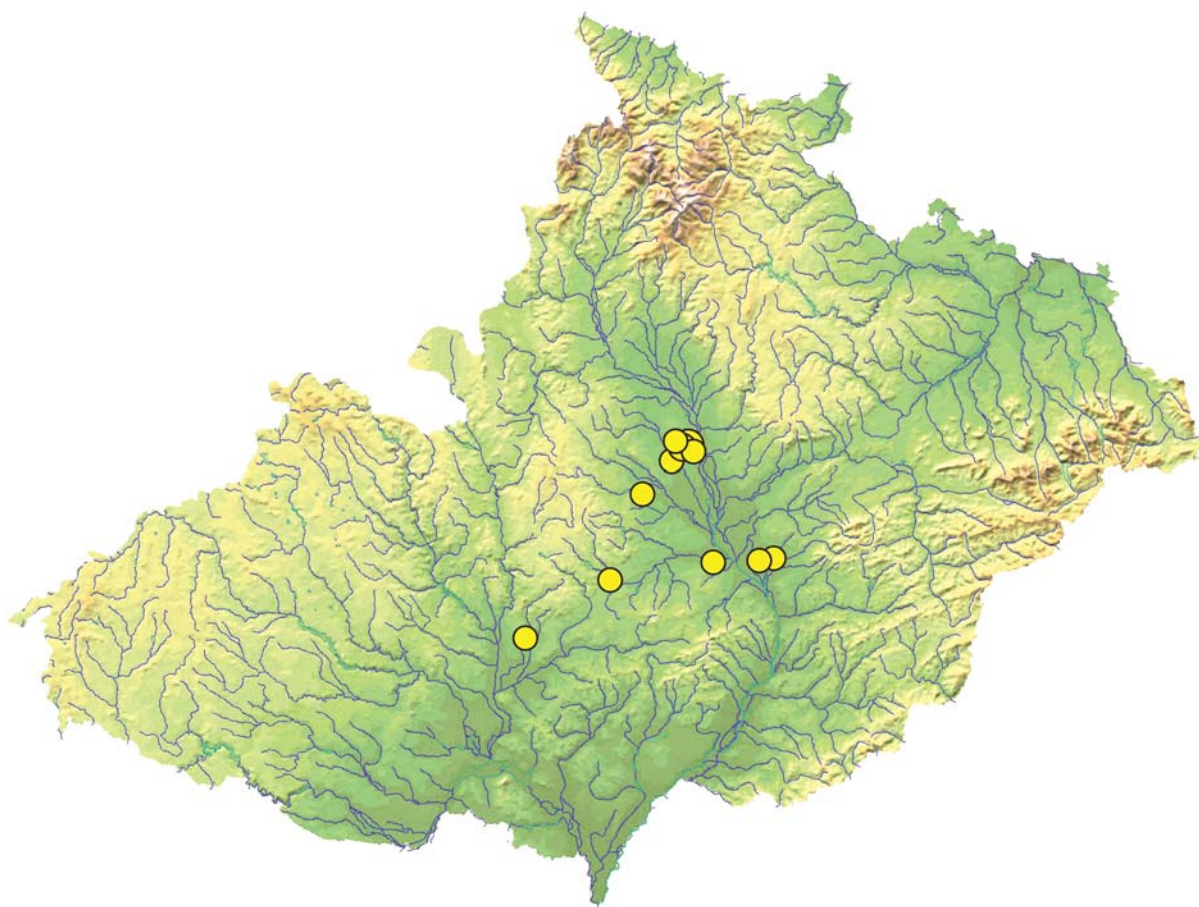


Fig. 3. Distribution map of graves with ruts/wheel slots in the MCWC in Moravia (map by P. Grenar)

The cross-section of these ruts/wheel slots (bowl-shaped, semi-circular) and taphonomy of the deceased do in no way contradict the hypothesis: just the opposite. We can take into consideration a hollow space as well as a “fall” of the human body from a minor height (the hull of a wagon) to the bottom of the grave pit (distance not larger than 0.5–0.7 m), anthropologists say. An exact evidence of the presence of wood in the ruts has been intensively sought (a new grave with wheel slots from Vyškov-Dědice, from which samples of the fill were taken for an analysis, unpublished). The absence of any wagon components (except the wheel slots) indicates an all-wood four-wheeled ceremonial wagon used for the burial of some selected individuals with no special social status (according to grave goods), similar to those that were used within the wider Black Sea region. However, the deposition of a deceased person on a wagon per se indicates a higher degree of social prestige (particularly well evidenced in the later Hallstat–La Tène Period). Because at that time we do not know any other wagon burials than those from the region north of the Black Sea and from Moravia, with a single exception of the Bulgarian site of Plachidol I T. I/Gr. 1 (PANAYOTOV 1989, 95–100, Fig. 64–71), the confirmation of this hypothesis would provide another conclusive evidence of direct contacts between the two above-mentioned regions during the 3rd millennium BC and a strong argument to support the results of accomplished archaeogenetic analyses. The general absolute dating of Budzhak culture is mainly based on two phases (3340–3150 BC and 2890–2680 BC: IVANOVA 2013, Fig. 23), of which particularly the later one is interesting to us.

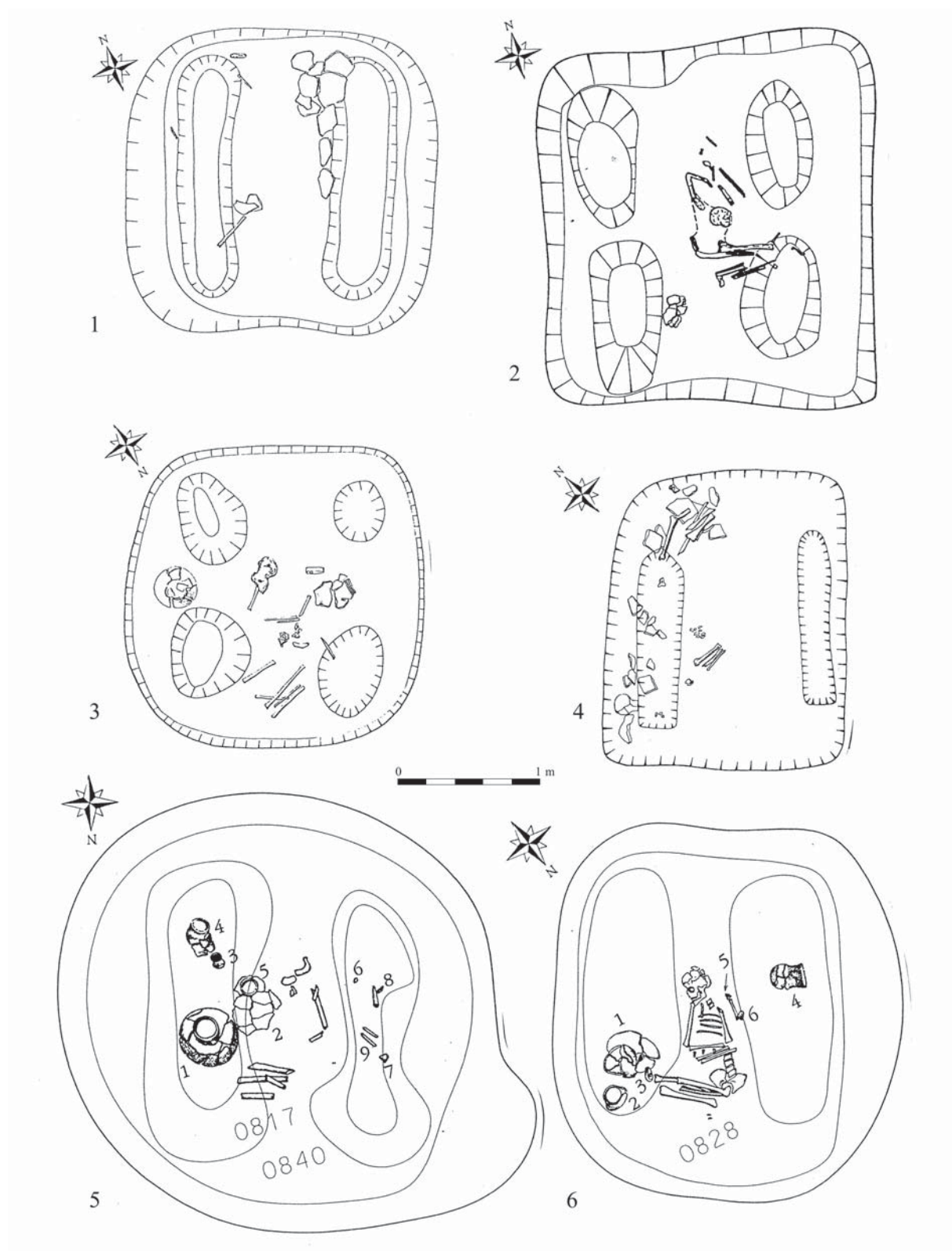


Fig. 4. Selection of MCWC graves with ruts in the bottom of the grave pit: 1. Olomouc-Nemilany 3, Gr. 4; 2. Olomouc-Nemilany 1, Gr. 50; 3. Olomouc-Slavonín 1, Gr. 19; 4. Bystročice, Gr. 1; 5. Olomouc-Nemilany 3, Gr. 18; 6. Olomouc-Nemilany 3, Gr. 28. Drawings by A. Pešková



Fig. 5. Example of a grave with wheel slots; right-sided contracted burial (probably male) with a stone hammer-axe. Drawing by A. Pankowská and L. Šín, photo by M. Paulus

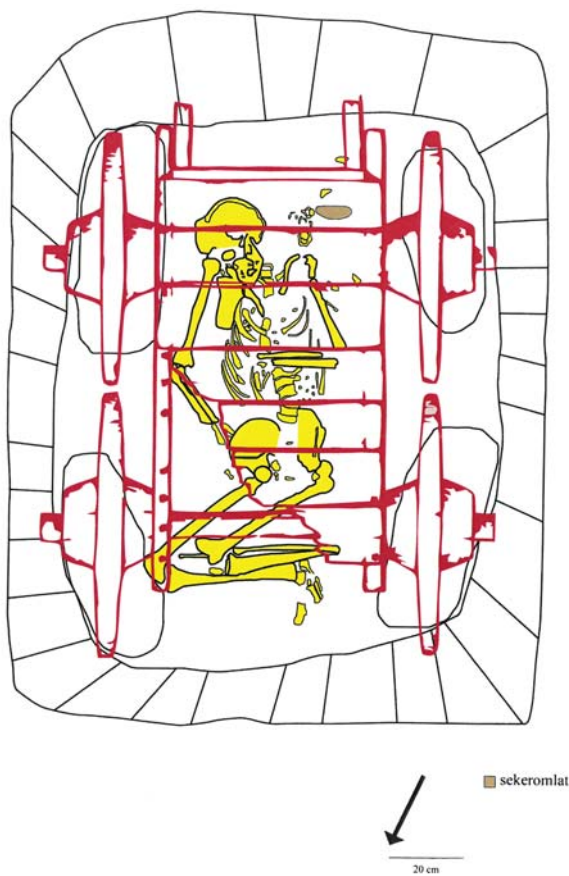


Fig. 6. Projection of a reconstructed Trialeti wagon into the ground-plan of Gr. 19 from Hulín-Pravčice 1 (P. Grenar)

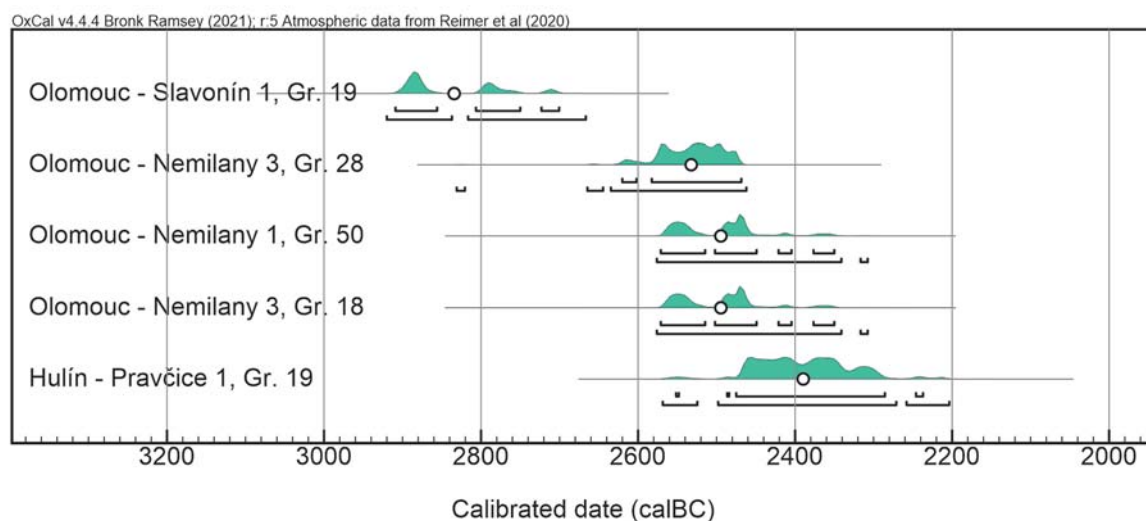


Fig. 7. Absolute dating (^{14}C) of MCWC graves with wagon burials in Moravia (graph by P. Grenar)

The dates acquired from CWC graves with ruts/wheel slots fall within the interval of 2910–2700, or 2580–2365 BC respectively, that is, generally to the time between 2800 and 2400 BC (Fig. 7).

Social stratification

Typical feature in most graves of Yamnaya and Catacomb cultures is the sporadic occurrence of funerary equipment, which seems to fade out with increasing distance from the crystallisation centre. This is particularly typical for graves of Yamnaya culture in the region east of the Black Sea, in the Carpathian Basin and in the Balkans. Seen purely from the perspective of funerary equipment, the situation with CWC is “better” because social differences are already well visible (PEŠKA 2022). Besides richly furnished graves (male burial Letonice T. 6; female burial Marefy I, Gr. 1) related to the steppe region (the spectrum of copper artefacts in Letonice), there also are burials without grave goods (PEŠKA 2013, 127), even though they are only a few in number. Among the richly furnished graves are also graves of craftsmen, more precisely metallurgists (Nechvalín, Tešetice, Velešovice and maybe also Hoštice-Heroltice: PEŠKA 2022), which are particularly frequent in the territory of Bell Beaker culture (PEŠKA 2016). A special category is represented by wagon burials, which do not count among the best equipped graves and their social or other significance must probably be sought elsewhere (maybe the fact of a wagon burial itself?). An illustrative example is a small cemetery at Vyškov-Dědice, where a grave with ruts/wheel slots (H 802) was equipped much more modestly (2 vessels, bone point and fragment of a quern-stone) than the neighbouring grave H 800 with pottery (2×), polished axe, two-edged copper dagger (“spatula blade” with analogies in the steppe region), copper awl, chipped stone industry, bone chisel and two bone points (unpublished).

Graves of craftsmen – metallurgists’ graves

The origins of depositing metallurgical implements in graves of specialised craftsmen have been sought in the eastern parts of Europe in the area to the north and east of the Pontus (BÁTORA 2002), where this phenomenon has a much longer tradition (Maykop culture). From there, it may have been distributed as a part of the so-called Yamnaya package (HARRISON – HEYD 2007) to Central Europe in the 2nd–3rd quarter of the 3rd millennium BC, still before its adoption by BBC (FITZPATRICK 2011, 213, 217). This is in no contradiction to the rich evidence of metallurgy in the territory of Vučedol culture (cf. DURMAN

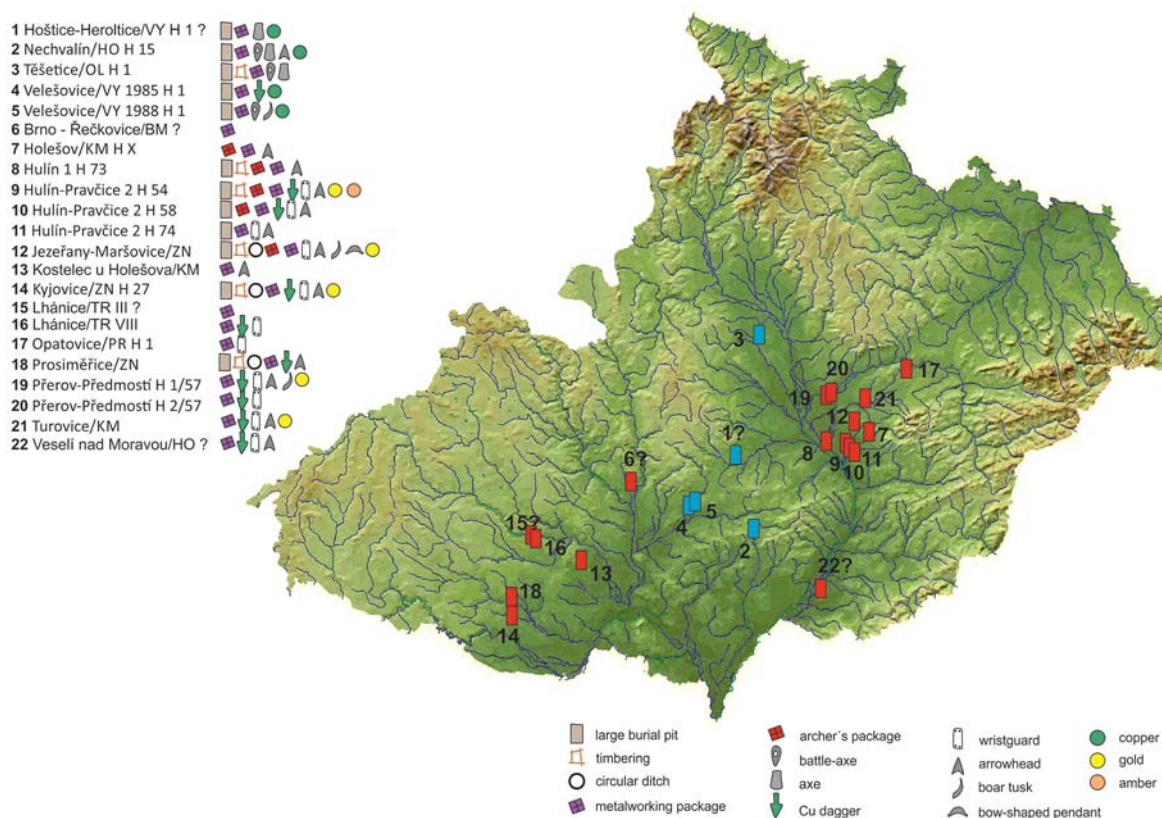


Fig. 8. Map of metallurgists' graves in the MCWC and BBC in Moravia (map by P. Grenar)

1988, 32–38, 58–60, cat. 203–208, 210, 220; BALEN 2005, Sl. 39–40, Tabla 59–61), from where we know the oldest grave of a metallurgist (chaser) under the burial mound Velika Gruda with absolute dates 3044–2879 BC (PRIMAS 1996, 48–52), or 3138–2859 BC respectively (new OxCal 4.3 calibration). In East Europe, we can mostly find graves of metal founders containing clay nozzles and casting moulds, and a combination with metalsmithing equipment is also common. Much more frequent with Central Europe, on the other hand, are hammers, anvils, boar tusks and various grindstones, i.e. implements for cold metalsmithing. Unlike the Pontic region and the East European tradition, where both types of metallurgy (metal founding, metalsmithing) occur parallel to one another, in Moravia we can observe a thorough separation of founding and chasing, both in the Beaker cultures and in the Early Bronze Age.

The MCWC graves from this category (Fig. 8) represent well-equipped, but not the richest, male burials or symbolical graves with male-specific equipment (Nechvalín, 2× Velešovice). Metallurgical equipment is limited to only solitary pieces – probably anvils (Těšetice, Nechvalín). The metalsmithing toolkit in grave H 1 from Velešovice I 1985 is composed of 3 pieces of stone – local sandstone, siltstone and Culmian greywacke – most probably in a functional combination of 2 anvils and 1 hammer (Fig. 9; ČIŽMÁŘ – GEISLER 1998, Tab. 34:20–22). Interpretation of a male burial from Hoštice-Heroltice (ŠEBELA 1999, 62–64, Pl. 21–23), from which a total of 3 polished axes (with blow marks) and a whetstone are known, is not clear. We cannot draw any definitive conclusions until a microscopic analysis is made, but the high amount of chipped stone industry among the grave goods enables to classify this grave at least as a craftsman's burial. This context finds an analogy in a (male) grave from Želešice (ŠEBELA 1999, 173–174, Pl. 122), which corresponds well with the occurrence of craftsmen's burials in the Black Sea region (cf. BÁTORA 2002; 2006; BERTEMES 2004; 2010; HARRISON – HEYD 2007; KAISER 2019).

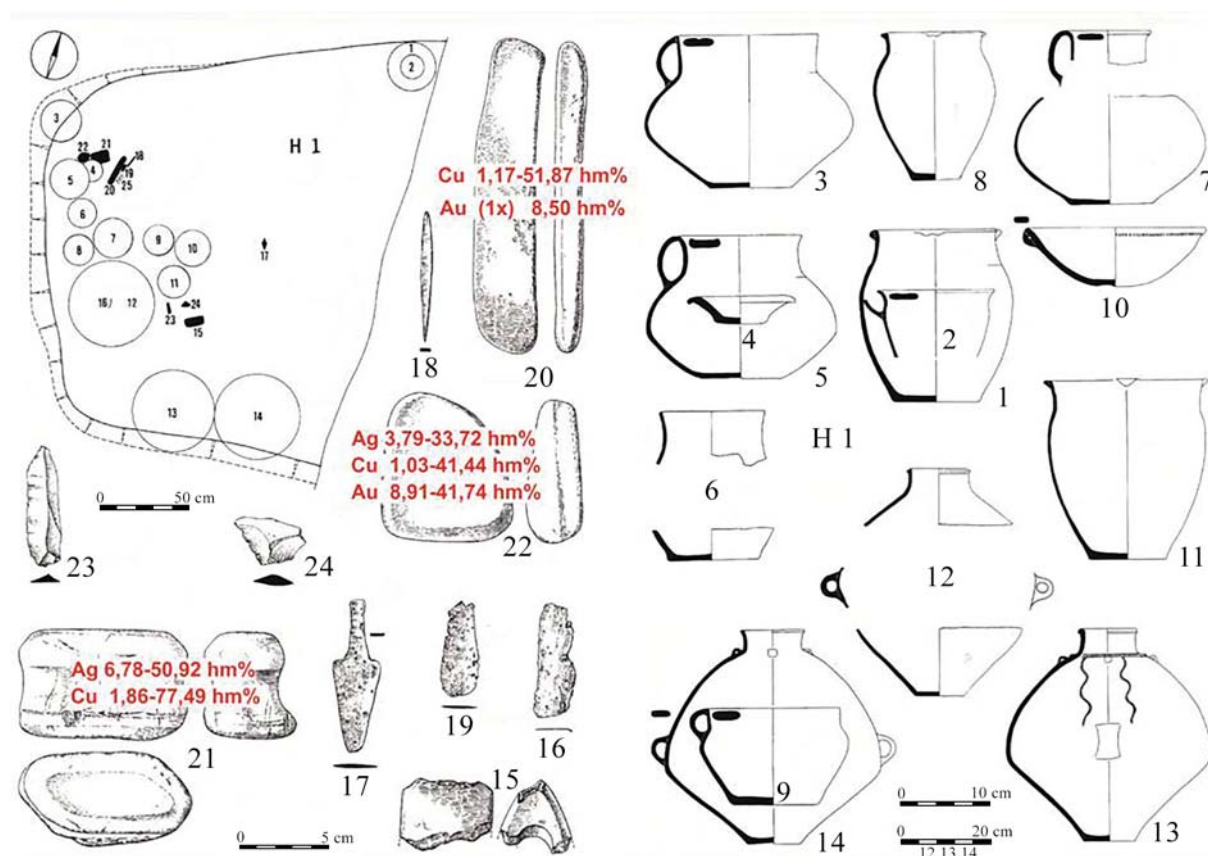


Fig. 9. Velešovice I 1985, H1 – a metallurgist's grave, containing among other things also a copper tanged dagger of eastern type, with measurement results of SEM analysis of the surface of stones that were part of the metallurgical toolkit (after PEŠKA 2021)

Hoard

Despite the unclarified beginning of occurrence of a new type of heavy implements (single-blade axes/shaft-hole axes: most recently DANI – SZEVEŘENYI 2021), whose origin reaches back to the 2nd half of the 5th millennium BC (Iran, Mesopotamia), we currently suppose that the technological knowledge of these different forms of tools has penetrated from the Caucasus through the South Russian and Ukrainian steppes to the Balkans and the Carpathian Basin (BENEŠOVÁ 1956, 243; BÁTORA 2003; DOBEŠ *et al.* 2019, 30). In the region north of the Caucasus, they appeared (maybe under the Mesopotamian-Iranian influence) in the Maykop culture in the mid-4th millennium BC and then also in graves of the Post-Mariupol culture, Kemi-Oba culture and subsequently also Yamnaya culture. The last-mentioned culture might have mediated their transfer to the Carpathian Basin, where plenty of them occur in hoards (Corbasca, Fajsz, Dunakömlöd, etc.) with a concentration in Transylvania (VULPE 1970, Abb. 1, Taf. 49), where they are rather ascribed to local cultures (Makó/Kosihy-Čaka). Similarly, in Moravia we associate the hoards from Brno-Líšeň, Vevčice and most recently Stavenice with Jevišovice culture (PEŠKA 2013, 38, obr. 17; DOBEŠ *et al.* 2019, 30–31, obr. 4). At least a chisel with pyramidal neck from Brno-Líšeň exhibits some relations to the hoard of Fajsz (KALICZ 1968, Taf. I:16,17), but mainly to graves of Maykop culture in the North Caucasus (Novosvobodnaya-Tsarskaya, Klady, Maykop: REZEPKIN 2000, tab. 63:5,7; BÁTORA 2006, 29–31, obr. 13–14). The chronological position of occurrence of the new tools at the turn of the 4th–3rd millennia BC or immediately below this boundary remains unchanged in our

territory, their cultural identity is still to be discussed. From the find contexts of MCWC we do not yet know any metal hoards and this type of axes was not laid into MCWC graves, unlike the male graves of Maykop culture (late Novosvobodnetskaya phase), Kemi-Oba culture, Yamnaya and Catacomb cultures, but also Middle Dnieper culture and Fatyanovo or Balanovo cultures (BÁTORA 2006, 13–54) with a wide interval of absolute dating 3500–3100 BC (Maykop) or 2910–2770/2496 BC (Yamnaya). Shaft-hole axes of the Early Bronze Age cultures are younger.

Technological sphere

Caucasian metallurgy

The revival of metallurgy and technological innovations after a decline at the time of the Baden Complex, which included a different method of smelting and casting into two-part moulds, dominant processing of arsenic copper and a higher amount of gold and silver objects, are summarised by SHERRATT (1997; 2003; 2004) under an umbrella term “Caucasian metallurgy” within his “Secondary Products Revolution”. Numerous examples of local production can be followed up in the territory of Vučedol culture, but also in the Post-Baden local cultures (Makó/Kosihi-Čaka, Somogyvár-Vinkovci) in the Carpathian Basin and in the Balkans (Vučedol, Vinkovci-Tržnica, Velika Gruda, Zók-Várhegy, Üllő, Velký Meder, Nevidzany, Tesárske Mlyňany), where they form a distinct civilisation horizon associated with this metallurgy that represents a part of the Yamnaya package (PEŠKA 2013, 70–71).

With the exception of the above-mentioned metallurgists’ graves, the problem of metallurgy in MCWC is in fact irresolvable due to absence (with but a few exceptions) of metal analyses and means of production. The new design of weapons/tools (shaft-hole axes) must be rather associated with Jevišovice culture. The form of a few specimens of tanged daggers, metrically different from tanged daggers of Bell Beaker culture (Velešovice, Kroužek: *Figs. 9–10*), resemble most the products of Yamnaya and Catacomb cultures in the North Pontic region, or as far as in Ural (HÄUSLER 1974, Tag. 2:7; 4:14,15; 7:7; 8:7 and other; 1976, Taf. 10:8; 37:7,17; 38:4; 43:4; 44:6; SHISHLINA 2008, Fig. 25:1; 33:11; 51:5; 68:4,5; 91:2; MORGUNOVA 2011, Fig. 2:6; 4:4,11), including the East Balkans (BĀJENARU – POPESCU 2012, Fig. 6:5–7; 7:1,2), but also e.g. the site of Tell Khaznah I in what is now Syria (BÁTORA 2006, obr. 6). The westernmost occurrence of such a dagger is known from an inhumation grave at Bleckendorf in Central Germany (BEHRENS 1952). Similar artefacts with a shorter grip tang and a longer and more slender blade (sometimes with a central rib) are known from the Ljubljana Marshes (Ig: KOROŠEC – KOROŠEC 1969, T. 105:8,9,11; ZIMMERMANN 2007 “Eurasian” Type BB2b). Similar metrical characteristics were also detected with e.g. a smaller two-edged knife from the burial mound Velika Gruda on the Montenegro coast of the Adriatic Sea (PRIMAS 1996, Abb. 7.1:M3), but also from the Vučedol site (SCHMIDT 1945, Taf. 48:19, 20). The form of the two last-mentioned specimens then resembles a less frequent new type of a dagger or knife (two edges, absence of pointed blade: earlier referred to as “spatula blade” from Letonice T. 6, Vyškov-Dědice) with analogies in the same territory (HÄUSLER 1976, Taf. 20:15,16; 24:6; 27:26; AGULNIKOV 2008, Rys. 3:8; IVANOVA 2012b, Rys. 6:2; BĀJENARU – POPESCU 2012, Fig. 6:8,9). The “razor” from Morkůvky (ŠEBELA 1999, Pl. 60:2) with a curved pointed blade is completely unique in the milieu of Corded Ware Culture and it has only a few parallels in the Yamnaya culture in a remote area between the Volga River and Ural (POLIN – CHERNYKH 2009, Rys. 1:4; MORGUNOVA *et al.* 2010; MORGUNOVA 2011, Fig. 5:6). Some East European parallels might be also identified with several awls. Direct connection is to be confirmed by spectral analyses in the future.

The blades of sheet-metal knives seem to be of Central European origin so far: it is indicated by their absence in East Europe, concentration in Moravia and Lower Austria, and by isolated finds in SW Slovakia (Šaľa) or Upper Bavaria (Kösching) (BENKOVSKY-PIVOVAROVÁ 2005; KOLÁŘ *et al.* 2011,

110, obr. 48:7; 49; PEŠKA 2013, 134, 137; KOLÁŘ 2018, 163, Fig. 137:19). We are not really convinced of their function, although ŠEBELA (1986, 135) noticed a different patina in a stripe along the spine of the specimens from Vážany nad Litavou and Brno I and hypothesized that the tool might have been set into a grip from organic material.

In MCWC, we do not find spiral hair rings from a massive silver, gold, electrum or copper wire, which are widespread east of our territory. Their occurrence seems to end in the burial mound at Neusiedl am See (RUTTKAY 2002; 2003). The coiled/spiral-shaped hair ornaments with one flat-hammered end, which are very frequent in MCWC as well as in Lower Austria, Bohemia, Poland and partly also in Central Germany, might be connected with steppe regions. The theory of their East European origin has been a little relativised by the occurrence of typologically absolutely identical specimens in the megalithic tombs of BBC on the Iberian Peninsula and in Southern France (PEŠKA 2004a, 104–105 ff.), which are related to the early phase of BBC in the given territory. On the other hand, the theory is supported by the fact that the finds in the Pontic region are older than the Late Trypillia (Usatovo) and Yamnaya cultures (ZBENOVICH 1974, Rys. 26:10–12; DERGACHEV – MANZURA 1991, Rys. 47:11; 68:6–8; MANZURA 1993, Fig. 6:9,10; AGULNIKOV 2008; Rys. 3:10; HÄUSLER 1976, Taf. 31:4; DERGACHEV 1986, Rys. 13:3–6; 18:11; FRÎNCULEASA 2007, Pl. 3:M1; 4:3; LARINA – MANZURA – CHACHEY 2008, Rys. 9:4; CHACHEY – POPOVICH 2010, Rys. 4:2,4; 11:3; IVANOVA 2013, Rys. 21, 22; FRÎNCULEASA *et al.* 2013, Fig. 9; Pl. 3:2; 16:7; KLOCHKO 2017, Fig. 10:2) and some of them only have an indicative flattening of one of their ends. This also applies to finds from the territory of East Balkans (ALEXANDROV 2017, Fig. 8; FRÎNCULEASA 2019, Pl. 8:2; 2020, Pl. 16:3; FRÎNCULEASA *et al.* 2019, Pl. VII). Flattening of both ends, which only occurs with specimens coiled from a massive double wire, was detected in a cemetery of Yamnaya culture in East Hungary (DANI –

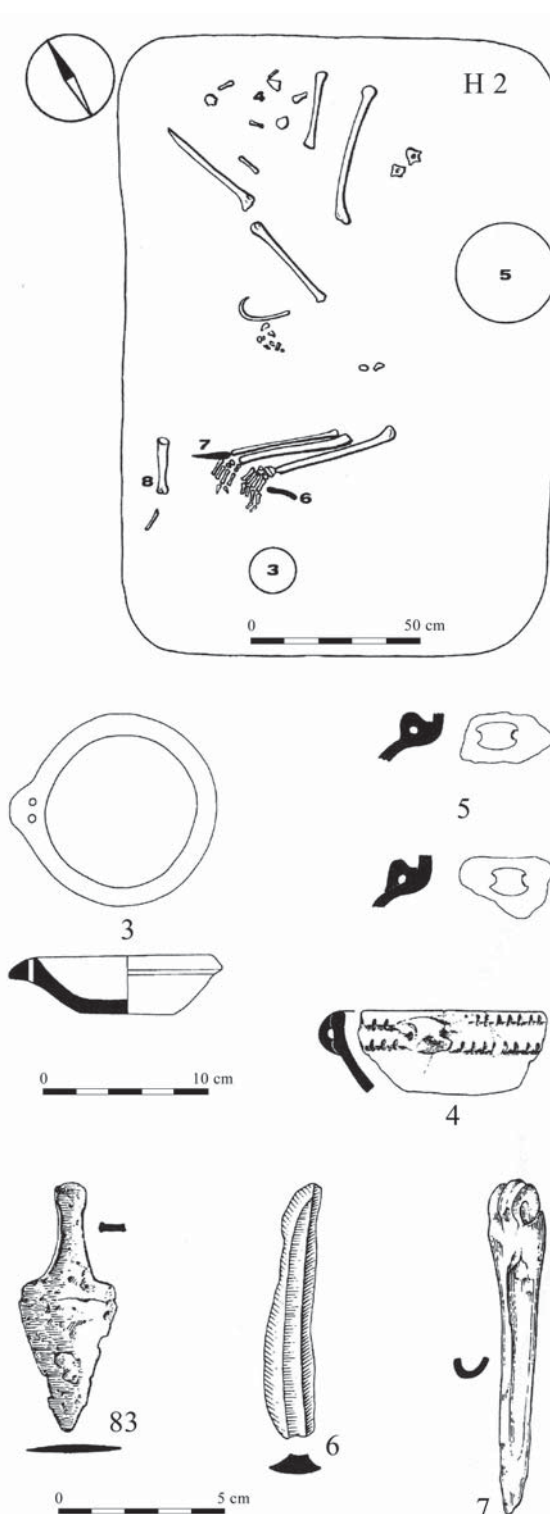


Fig. 10. Kroužek 1985, Gr. 2 – an MCWC grave with a tanged dagger of eastern type (after ČIŽMÁŘ – GEISLER 1998)

NEPPER 2006, Fig. 4:2,3; 5:3,4; GERLING *et al.* 2012, Fig. 5: graves 4 and 7–7a) and other indications can be observed with finds from North Bulgaria (ALEXANDROV 2009, Fig. 1). A link between them might be the simple spirals with flat-hammered end that occur in the CWC in Lesser Poland (e.g. WŁODARCZAK 2006, Tabl. LXXXVI:5,6).

Simple wire neck rings in Corded Ware graves (besides Moravia also Lesser Poland, Bohemia, less frequently Lower Austria) have their predecessors already in the time of classical and Late Baden Culture in Lower Austria and in the Spiš region (Baden-Königshöhle, Leobersdorf, Lichtenwörth, Veľká Lomnica) (here the type with loop ends: NOVOTNÁ 1981; 1984; 2006). Reference is made to specimens from the Carpathian Basin, which already occurred since the beginning of the Eneolithic (Polgár Complex – Bodrogkeresztúr phase: grave from Decea Mureşului), and to those from the Horodnica hoard in the Ukraine (similar dating: SULIMIRSKI 1961), which are surprisingly older than the specimens in Eastern Mediterranean (Ras Shamra, Byblos – hoard). These neck rings occur in the Suvorovo-Novodanilovka Culture (Giurgiuleşti I, Gr. 1: DERGACHEV 2002, Taf. 10: A2), in the Yamnaya culture, including the Crimea (Kemi-Oba culture: HÄUSLER 1976, Taf. 34:12; 44:15), and in pre-Yamnaya graves in Romania (FRÎNCULEASA – PREDA – HEYD 2015, Pl. 9:2). In our territory, they continue until the Epi-Corded phase of the Bronze Age (BÁTORA 2000, 321–322; PEŠKA 2013, 138).

Considering the extent of this contribution, in the following text we will only briefly describe the relations of MCWC material to the East European territory.

Economic sphere

The complicated problem of horse domestication, including a theory that horses originate from a single place, is not yet satisfactorily solved. One of the domestication hypotheses refers to East European and Asian steppes (Black Sea region and Kazakhstan) in 3500–2500 BC, whereas the second hypothesis is based on the assumption that we do not know any direct evidence of domestication until 3000 BC. The first cases of domestication are said to have appeared in the territory of Sintashta-Petrovka Culture in the Ural Steppes (wagon burials) around 2000 BC. Later examples are known from the Near East, Egypt, China, Greece and Central Europe (most recently MÍROVÁ 2019, 172). It is true that we do not have any direct proof that horses were used around 3000 BC (maybe except the horse bones on individual sites and the finds of bone toggles), but older indirect evidence (models of wheels and wagons, finds of wooden wheels since the Boleráz Group and osteological remains since the classical Baden Culture) makes us consider whether the wagons and carts of that time were pulled only by bovine animals or whether horse also played some role.

A separate issue, which is not really easy to grasp, is the supposed predominant pastoral economy associated with breeding of large herds, transhumance and practical use of bred animals (sheep for wool). This type of economy is well applicable to the eastern steppe regions. The increasing number of detected MCWC settlement sites (PEŠKA – FOJTÍK – DAŇHEL 2021), together with several grave goods related to agriculture (blades with gloss, grinding plates, millet finds) in Corded Ware graves might indicate at least a mixed pastoral/agricultural economy.

As already mentioned above, wagon burials must have demanded high production and organisation skills, but the gender-specificity or amount of grave goods cannot be considered an indisputable social attribute. The full impact of this symbol should probably be sought in some other sphere.

Innovations in material culture

The change of hairstyle (and fashion?) is indicated by the use of massive simple (max. up to 2.0 coils) gold, silver or electrum spiral hair rings (*Lockenringe*) outside the territory of CWC, with an origin in East Europe. In the territory of CWC, multi-coil helical/spiral-shaped hair rings with one flat-hammered end are preferred, with remarkably identical analogies in West Europe (PEŠKA 2004b). Similarly, the bone toggles (*Knochenknebel*), which are still missing in Moravia, became part of the funerary equipment of Corded Ware graves as far as in Poland and Lower Austria.

The problem of the origin of bone/antler/mother-of-pearl/amber or sheet-metal solar discs, which occur in the CWC (and in the related cultures in the Baltic Sea region and in the area of lacustrine villages in West Switzerland) as well as in graves of the Globular Amphora culture (GAC), Złota culture and Late Catacomb culture (a variant made from sheet metal), must still remain open, although some indications of transfer from the east to the west are known (KAISER 2019, 260–270). In our territory, this category of artefacts is represented by the disc from Hřivice (MOUCHA 1981) and by a more recent grave find with problematic absolute dating from Olomouc-Nemilany 4 (KALÁBEK – PEŠKA 2006; KRÁLÍK *et al.* 2006; PEŠKA 2011; 2013, 148–149, obr. 99, 100). It seems that the discs that were found outside the North Pontic region were decorated with a radial (solar) rather than with a cross-shaped motif. However, the finds of GAC and CWC in the territory of Poland, Denmark, Bohemia or Switzerland indicate a more general predominance of this decorative pattern (PEŠKA 2013, obr. 102).

The cord-ornamented pottery is a wide-reaching phenomenon because it appears in a vast territory during multiple chronological horizons, e.g. from the 2nd half of the 5th millennium BC (Sredny Stog II), from the 1st half of the 4th millennium BC (Cernavoda I), from the 2nd half of the 4th millennium BC (Baden/Cotofeni), or in various chronological horizons of Southeast Europe respectively (ROMAN 1974; ROMAN – DODD-OPRIȚESCU – JÁNOS 1992; BERTEMES 1993; 1998; KOTOVA 2010). So, it certainly does not represent an original part of the “Yamnaya package” (KAISER 2019, 259–260) but counts among characteristic attributes of steppe cultures, among them also the Yamnaya culture. Some researchers associate the cord-imprinted décor especially with the last-mentioned Yamnaya culture during the Final Eneolithic (VLADÁR – WIEDERMANN 2020). This type of decoration certainly accompanied the origins of Corded Ware. In our territory, it already occurred earlier than with CWC, but still within the chronological range of the intrusion of Yamnaya culture (Jevišovice, GAC, Late Baden).

The cross-footed bowls, most of them decorated on both inner and outer surface, also appear in a vast territory from the North Caucasus, or from the Middle and Upper Don, to Central Europe (Carpathian Basin, Western Balkans). They have a strong representation in Vučedol culture and Ljubljana Marshes, with some differences between the Vučedol and Yamnaya bowls, so that sometimes an autochthonous development has been considered (KAISER 2019, 255–257). It is to remark that these bowls have no successor in the Yamnaya culture (leaving aside the East European censors, which are mainly widespread in the Catacomb culture). In our territory, we can find them in the whole Late Eneolithic Cultural Complex, where they are referred to as Ljubljana bowls (Cham, Řivnáč, Jevišovice, Makó/Kosihy-Čaka, Somogyvár-Vinkovci). The cross-footed bowls, similarly as jugs (vessels) with an asymmetrical handle, can be classed among contact finds, which interconnect geographically and culturally different regions within a certain chronological horizon.

Clay funnels so far occur outside the proper CWC e.g. in the context of Jevišovice culture and GAC (PEŠKA – VRÁNA 2017, 60–61, obr. 8:3; 10), but also in Somogyvár-Vinkovci and Vučedol (2 specimens from a burial chamber) or in the Kostolac culture from Sarvaš (BALEN 2005, 49, Cat. Nos. 187–193; Pl. 50:187–190; 51:191–193) with convincing parallels in Yamnaya and Catacomb cultures of the East European Steppes to as far as Kalmykia (HÄUSLER 1974, Taf. 11:17; 17:15; 24:18; 28:18; SHISHLINA

2001, 24–26, Fig. 5; SHISHLINA – TSUTSKIN – FIRSOV 2001, Fig. 8; 12:1). A non-discussed problem that remains here is the technique of broom strokes (broom finish) applied to the surface of ceramic vessels.

The category of contact finds occurring in CWC (outside of Moravia) with clear analogies in the North Pontic-Caucasian region also comprises crook/hammer-headed bone pins (KAISER 2019, 260–262; GESSNER 2005; MANSFELD 2005), bone tubes (game calls?) and the so-called pan flutes (HÄUSLER 1974, Taf. 7:6; 19:4; 21:3; WRÓBEL 1985, Rys. 3; BÁTORA – STAŠŠÍKOVÁ-ŠTUKOVSKÁ 1993; SHISHLINA 2008, Fig. 87:9; 90:4,7; LARINA – MANZURA – CHACHEY 2008, Rys. 31:2–5; IVANOVA 2012b, Rys. 6:5; BÁTORA 1999, 36–39; 2006, 171–175; 2009, 246–247; ŠMÍD 2000; WŁODARCZAK 2006, Tabl. XXXII:6; LXIX:8), whose occurrence continues to the Epi-Corded Carpathian Cultural Complex in the Early Bronze Age and fades out at its end. A little more complicated is the case with necklaces from animal teeth or composite necklaces that occur with various intensity in both of the studied regions, so that we are not sure whether or not they influenced one another.

The second fundamental component of material culture in the MCWC is its so-called local pottery with closest analogies in the south and southeast (Western Balkans, Carpathian Basin), which was already accentuated by ONDRÁČEK (1965). The local pottery has partly evolved from domestic forms but, since recently, several forms are considered of East European origin (amphorae with raised relief decoration etc.: IVANOVA 2012b, Rys. 4,5; 2013, Rys. 2, 6, 8, 15–17). The occurrence of so-called Schönfeld-type bowls is to be connected with western territories, whereas the single-edged copper blades (knives) are most probably of local and regional origin (Moravia, Lower Austria). Southern origin (Ljubljana Marshes) might be supposed with bone belt-hooks of type Ig and their imitations (Brno-Veverí Street: ŠEBELA 1999, Pl. 3:1). The all-metal hammer-axe of type Eschollbrücken from Lužice u Hodonína (KIBBERT 1980; MARAN 2008; KERIG 2010) is thought to be of western origin.

When we follow up steppe influences in the material content of MCWC, or CWC in general, we can observe a certain degree of concentration or common occurrence of these artefacts or phenomena in grave complexes: e.g. wagon and “spatula blade” in Vyškov-Dědice (unpublished), “spatula blade”, awl and pottery in Letonice, tumulus 6 (ŠEBELA 1999, Pl. 43–47), Velešovice I 1985, H 1 (ČIŽMÁŘ – GEISLER 1998, Tab. 34, 35), etc. Another parallel might be the repeated occurrence of an analogous funerary equipment in the two studied regions: pottery – pin – awl – knife/dagger (Bleckendorf – Letonice – Vyškov-Dědice – Taraclia: e.g. IVANOVA 2012a, Rys. 6.95:6).

The analysis of the MCWC material culture has identified a wide spectrum of East European influences. This finding might be connected to a considerable extent with the internal development of the culture itself, but also with intrusion of steppe elements (Yamnaya culture) from the eastern territories towards the west, which is also reflected in the genome of contemporaneous and subsequent populations (most recently HAAK – KRAUSE 2020).

Features within the sphere of Corded Ware culture, which with a certain degree of probability can relate to East European territory:

- the phenomenon of burial mounds (the original concept comes neither from Central nor from East Europe; the problem of continuity?)
- burials in supine position of the upper body with contracted lower extremities lying on the right or left side (*Rückenhocker*), but the burial rites otherwise have their own specifics
- rhombic position of lower extremities (so far only outside of MCWC)
- internal wooden constructions in graves – houses of the dead?
- ruts/wheel slots in the bottom of graves – probably wagon burials
- the custom of scattering ochre over the skeletons or laying ochre lumps into graves is older (Tiszapolgár, Bodrogkeresztúr, Boleráz, Baden) and, unlike the western Yamnaya region, it has not been applied to CWC graves

- one part of ceramic production (cord-ornamented ware, asymmetrical handles on vessels, clay funnels, raised relief decoration, broom finish?)
- stone hammer-axes and maces
- innovations in metallurgy
- graves of craftsmen, more precisely metallurgists
- one part of metallurgical production (shaft-hole axes, tanged daggers, a new type of daggers, “razor”, neck rings)
- change of hairstyle fashion (ideology of helical/spiral-shaped hair rings – *Lockenringe*)
- ornamented solar discs?
- application of boar tusks: at the skull, headband, headdress? (unclear evidence in MCWC)
- crook/hammer-headed bone pins
- bone tubes (game calls)?
- pan flute
- faience beads (not yet in MCWC, in our territory later in the Early Bronze Age)

Conclusions

The presence of steppe nomadic groups in Central Europe was identified to have taken place in several waves. The oldest wave dates back to the turn of Tiszapolgár and Bodrogkeresztúr cultures in the Early Eneolithic. This wave was associated with a masculine and hierarchical society with relations to Varna Culture, rich raw material sources in the SE Balkans and tumulus cultures in the North Pontic region (Suvorovo-Novodanilovka). The second wave is associated with the so-called Pre-Yamnaya culture and, in the Carpathian Basin, with Late Bodrogkeresztúr culture, Lažňany-Hunyadihalom Group, Boleráz and Cernavoda II. The third wave is related to Early Yamnaya culture (at the level of Baden/Coţofeni II). In the course of further development, people of Yamnaya culture are even thought to have induced the collapse of the Baden unity and to have instigated the emergence of the Late Eneolithic Cultural Complex (Post-Baden). The autochthonous population in Middle and East Slovakia responded to this situation with the build-up of Late Baden hilltop settlements.

In Moravia, immediately before or during the Early MCWC, we can follow up an intrusion into the sphere of Late Jevišovice culture (Kroměříž-Miřetice: *Figs. 11–12*), maybe through the Livezile Group (unless the people of this group in fact represent a local Yamnaya variant), whose impact reaches as far as into Central Bohemia (pottery from Kutná Hora-Denemark: ZÁPOTOCKÝ – ZÁPOTOCKÁ 2008, Tab. 34:1; 78:2; PEŠKA – TAJER 2006; 2009; PEŠKA 2011) or even into Central Germany (the above-mentioned graves at Bleckendorf and Profen). As we convincingly demonstrated, the MCWC exhibits close relations to East European regions, more precisely to Yamnaya and Catacomb cultures between the North Pontic region and the Caspian Sea. They are strongly expressed both in the burial rites and in material culture, technologies, but also in the ideological sphere and the economic-social base (most probably a mixed pastoral-agricultural economy). The tested “Yamnaya package” has not been adopted without exceptions (anthropomorphic stelae, ochre, bone toggles), but it had a sufficiently strong influence on the formation of later so-called local phases of MCWC. A significant phenomenon, identified recently in Moravia, is represented by the wagon burials, which are known (with one exception – Plachidol) solely from the Pontic-Caucasian region. They represent another clear direct evidence of contacts and relations of Central European population of CWC to the Black Sea and North Caucasian territories. The question of to what extent the East European civilisations have also genetically participated in the rise and development of MCWC (it appears in our territory de facto completely formed, the finds from the

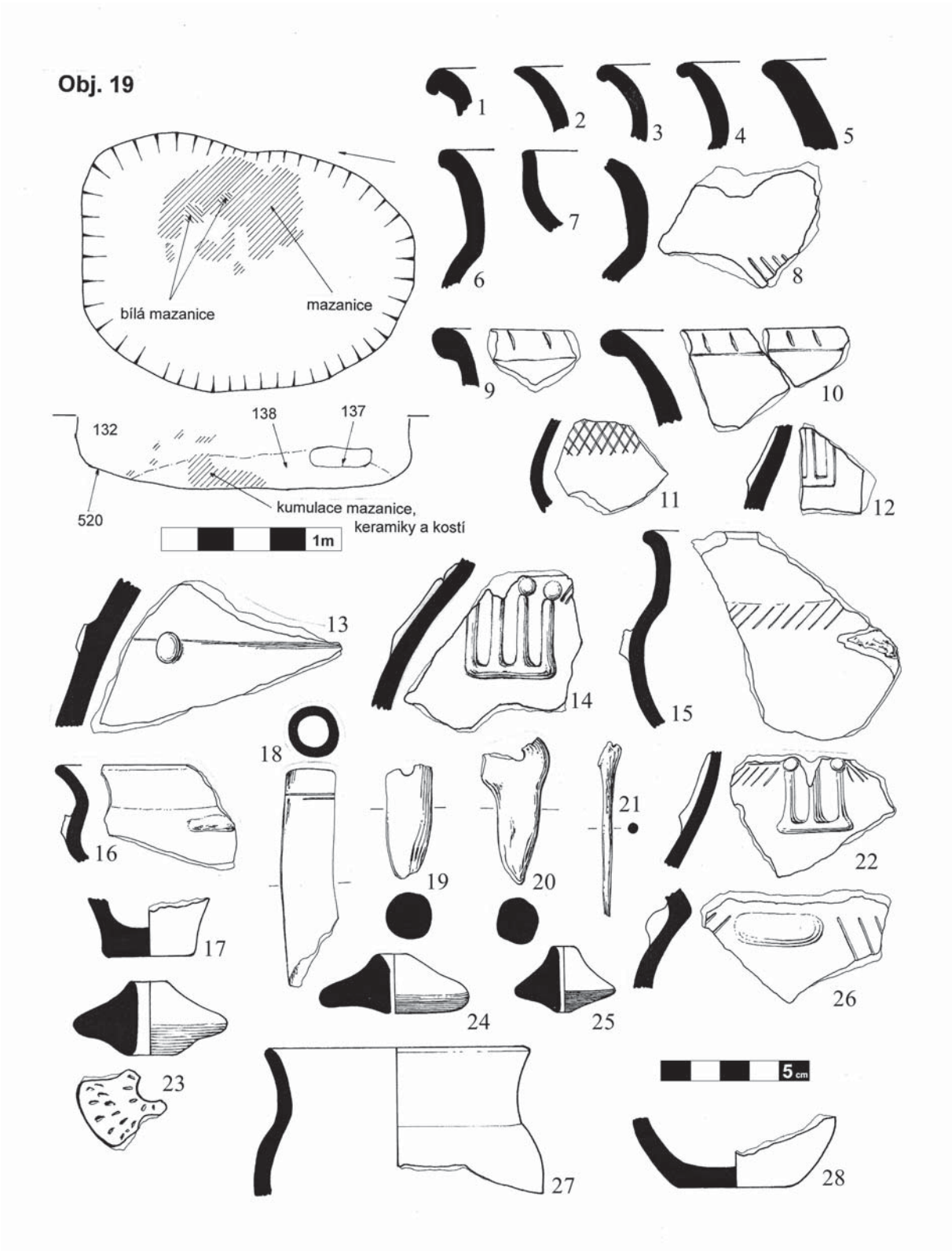


Fig. 11. Kroměříž 3 – Miňůvky, selection of finds from a settlement of Late Jevišovice Culture (after PEŠKA 2011)

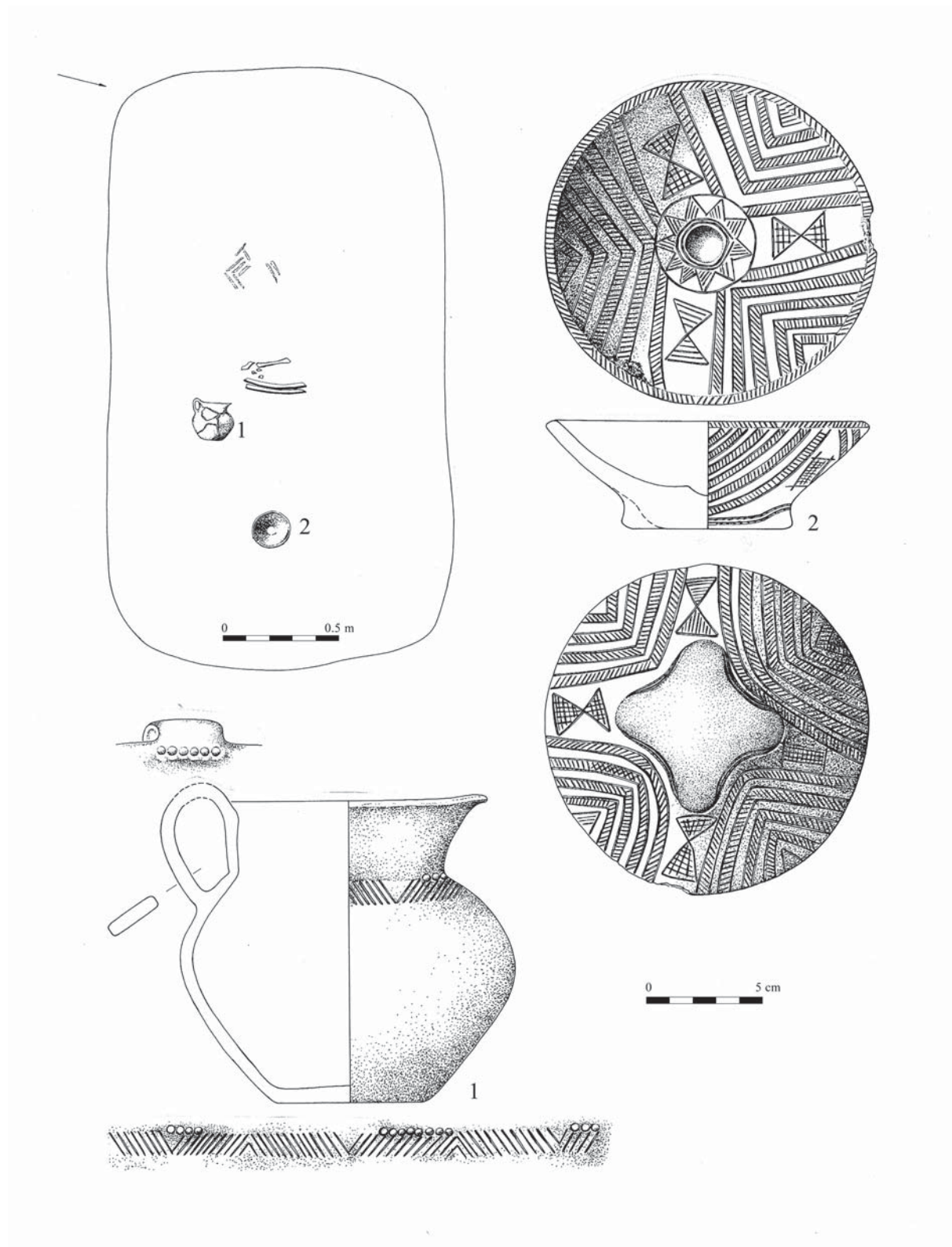


Fig. 12. Kroměříž 3 – Miňůvky H1, a grave of Jevišovice Culture with an askoid jug and a footed bowl decorated on both inner and outer surface (after PEŠKA 2011)

initial phase are almost absent, in the early phase we identify strong relations to the Bohemian CWC) must be answered by further, mainly archaeogenetic, research.

In the Post-Yamnaya period, we are currently trying to distinguish steppe components in the context of the Bell Beaker phenomenon (HARRISON – HEYD 2007; HEYD 2016; 2017; 2019) and many elements from eastern steppes still can be found in the Early Bronze Age as well (ochre in Branč, willow-leaf industry in the Epi-Corded Cultural Complex, construction of the grave at Jelšovce with analogies in Srubnaya Culture, circular complex at Vráble-Fidvár with relations to the Sintashta-Petrovka sphere, stele from Spišský Štvrtok? etc.). So, it is evident that the contacts and influences from the East European steppe zone were in no way an ephemeral and one-time event, but occurred repeatedly in waves with various intensity during the Eneolithic and at the beginning of the Early Bronze Age. However, the intrusion of Yamnaya culture around 3000 BC seems to have been strongest, with wide-reaching impact including the formation and development of the Moravian group of CWC, in which these relations are very intensively demonstrated. Their essence, structure and character (direct population influx, influences, long-distance contacts? etc.) are to be identified and explored by future research, preferably in interdisciplinary collaboration.

References

AGULNIKOV, S. M. 2008

Arkheologicheskiye naslediyе Budzhaka, Kratkiy ocherk arkheologicheskikh pamyatnikov Budzhaskoy stepi. *Revista de etnologie și culturologie* T. III (2008) 227–243.

ALEXANDROV, S. 2009

Ukrašeniya za kosa ot zlato i srebro prez bronzovata epoha v severna Blgaria. *Archeologija* L/1–2 (2009) 7–20.

ALEXANDROV, S. 2017

Der Hortfund nahe Petrovič. In: Haag, S. – Popov, Ch. – Horejs, B. – Alexandrov, St. – Plattner, G. (eds.): *Das erste Gold. Ada Tepe. Das älteste Goldbergwerk Europas. Eine Ausstellung des Kunsthistorischen Museums Wien in Kooperation mit dem nationalen Archäologischen Institut mit Museum der Bulgarischen Akademie der Wissenschaften. Sofia (NAIM) und Institut für Orientalische und Europäische Archäologie der Österreichischen Akademie der Wissenschaften. Wien (OREA) 7. März bis 25. Juni 2017. Kunsthistorisches Museum Wien*. Wien 2017, 124–125.

ALLENTOFT, M. E. – SIKORA, M. – SJÖGREN, K.-G. – RASMUSSEN, S. – RASMUSSEN, M. – STENDERUP, J. et al. 2015

Population genomics of Bronze Age Eurasia. *Nature* 522 (2015) 167–172.

ANTHONY, D. W. 2007

The Horse, the Wheel, and Language: How Bronze-Age Riders from the Eurasian Steppes Shaped the Modern World. Princeton and Oxford 2007.

BALEN, J. 2005

Sarvaš, Neolitičko i eneolitičko naselje. Musei Archaeologici Zagabiensis Catalogi et Monographiae 2. Zagreb 2005.

BĂJENARU, R. – POPESCU, A.-D. 2012

Pumnales de metal cu limbă la mâner din bronzul timpuriu și mijlociu din spațiul carpato-dunărean. In: Sîrbu, V. – Matei, S. (eds.): *Un monument din Carpații Orientali cu reprezentări din preistorie*

și evul mediu – Nucu – „Fundu peșterii“ Județul Buzău. Muzeul Județean Buzău. Monografii arheologice și istorice IV. Brăila – Buzău 2012, 363–433.

BÁTORA, J. 1999

Gräber mit Totenhäusern auf frühbronzezeitlichen Gräberfeldern in der Slowakei (Beitrag zu Kulturverbindungen zwischen Mittel-, West- und Osteuropa). *Prähistorische Zeitschrift* 74 (1999) 1–57.

BÁTORA, J. 2000

Das Gräberfeld von Jelšovce/Slowakei. Ein Beitrag zur Frühbronzezeit im nordwestlichen Karpatenbecken. Prähistorische Archäologie in Südosteuropa, Band 16, Teil 1 and 2, Kiel (Oetker/Voges) 2000.

BÁTORA, J. 2002

Contribution to the Problem of „Craftsmen“ Graves at the End of Aeneolithic and in the Early Bronze Age in Central, Western and Eastern Europe. *Slovenská Archeológia* 50 (2002) 179–228.

BÁTORA, J. 2003

Kupferne Schaftlochäxte in Mittel-, Ost- und Südosteuropa (Zu Kulturkontakten und Datierung – Äneolithikum/Frühbronzezeit). *Slovenská archeológia* 51 (2003) 1–38.

BÁTORA, J. 2006

Štúdie ku komunikácii medzi strednou a východnou Európou v dobe bronzovej. Bratislava 2006.

BÁTORA, J. 2009

Hroby s dýkami na pohrebisku zo staršej doby bronzovej v Ludaniciach-Mýtnej Novej Vsi. *Slovenská Archeológia* 57 (2009) 221–260.

BÁTORA, J. – STAŠŠÍKOVÁ-ŠTUKOVSKÁ, D. 1993

Einzellängsflöten aus der Frühbronzezeit in der Slowakei. In: Pavúk, J. (ed.): *Actes du XIIe Congrès International des Sciences Préhistoriques et Protohistoriques. Bratislava 1.–7. Septembre 1991.* Bratislava 1993, 370–375.

BEHRENS, H. 1952

Ein neolithisches Grab aus Mitteldeutschland mit beinerer Hammerkopfnadel und Kupfergeräten. *Mitteldeutsche Jahresschrift für Vorgeschichte* 36 (1952) 53–69.

BENEŠOVÁ, A. 1956

Nález měděných předmětů na Starých Zámcích v Brně-Lišni. *Památky archeologické* 47 (1956) 236–244.

BENKOVSKY-PIVOVAROVÁ, Z. 2005

Zur Grabkeramik der Kosihiy-Čaka/Makó-Kultur. *Archaeologia Austriaca* 89 (2005) 133–143.

BERTEMES, F. 1993

Rezension zu P. I. Roman. In: Dodd-Oprițescu, A. – János, P. (eds): *Beiträge zur Problematik der schnurverzierten Keramik Südosteuropas. Internationale Interakademische Kommission für die Erforschung der Vorgeschichte des Balkans.* Monographien 3 (Mainz am Rhein 1992). Saarbrücker Studien und Materialien zur Altertumskunde 2 (1993) 229–245.

BERTEMES, F. 1998

Überlegungen zur Datierung und Bedeutung der schnurverzierten Keramik im nördlichen Karpatenbecken und Siebenbürgen. In: Hänsel, B. – Machnik, J. (eds): *Das Karpatenbecken und die osteuropäische Steppe. Nomadenbewegungen und Kulturaustausch in den vorchristlichen*

Metallzeiten (4000–500 v. Chr.). Südosteuropa Schriften 20. München und Rahden/Westf. 1998, 191–209.

BERTEMES, F. 2004

Frühe Metallurgen in der Spätkupfer- und Frühbronzezeit. In: Meller, H. (ed.): *Der geschmiedete Himmel. Die weite Welt im Herzen Europas vor 3600 Jahren. Begleitband zur Sonderausstellung. Landesmuseum für Vorgeschichte Halle (Saale) 15. Oktober 2004 – 24. April 2005. Dänisches Nationalmuseum Kopenhagen 1. Juli 2005 – 22. Oktober 2005. Weiss-Engelhorn-Museen Mannheim 4. März 2006 – 9. Juli 2006.* Stuttgart 2004, 144–149.

BERTEMES, F. 2010

Die Metallurgengräber der zweiten Hälfte des 3. und der ersten Hälfte des 2. Jt. v. Chr. im Kontext der spätkupferzeitlichen und frühbronzezeitlichen Zivilisationen Mitteleuropas. In: Meller, H. – Bertemes, F. (eds.): *Der Griff nach den Sternen. Wie Europas Eliten zu Macht und Reichtum kamen. Internationales Symposium in Halle (Saale) 16. – 21. Februar 2005. Tagungen des Landesmuseums für Vorgeschichte Halle (Saale) 5.* Halle (Saale) 2010, 131–161.

BRANDT, G. – HAAK, W. – ADLER, C. J. – ROTH, C. – SZÉCSÉNYI-NAGY, A. – KARIMNIA, S. et al. 2013

Ancient DNA Reveals Key Stages in the Formation of Central European Mitochondrial Genetic Diversity. *Science* 342 (2013) 257–261.

BUCHVALDEK, M. 1986

Kultura se šňůrovou keramikou ve střední Evropě I, Skupiny mezi Harcem a Bílými Karpaty – Die schnurkeramische Kultur in Mitteleuropa I, Die Gruppen zwischen dem Harz und den Weissen Karpaten. Praehistorica XII, Praha 1986.

CHACHEY, V. – POPOVICH, S. 2010

Raskopki kurganov u. s. Giurgiulești v Nizhnem Poprutye. *Revista Arheologică* VI/1 (2010) 130–150.

CZENE, A. 2017

The Position of the Bell Beaker-Csepel Group at Budakalász. In: Kulcsár, G. – Szabó, G. V. – Kiss, V. – Váczi, G. (eds.): *State of the Hungarian Bronze Age Research. Proceedings of the conference held between 17th and 18th of December 2014.* Budapest 2017, 179–199.

ČIŽMÁŘ, M. – GEISLER, M. 1998

Hroby kultury se šňůrovou keramikou z prostoru dálnice Brno – Vyškov – Gräber der Kultur mit Schnurkeramik aus dem Raum der Autobahn Brno – Vyškov. Pravěk Supplementum I, Brno 1998.

DANI, J. – NEPPER, I. M. 2006

Sárrétudvari-Órhalom, Tumulus Grave from the Beginning of the EBA in Eastern Hungary. *Communicationes archaeologicae Hungariae* (2006) 29–63.

DANI, J. – SZEVEŘÉNYI, V. 2021

Archaeological Evidence for Steppe and Caucasian Connections in the Carpathian Basin between the 4th and mid-3rd Millennia BC. Is there a „Yamnaya Package“? In: Giemsch, L. – Hansen, S. (eds.): *The Caucasus: Bridge between the urban centres in Mesopotamia and the Pontic steppes in the 4th and 3rd millennium BC. Proceedings of the Caucasus Conference, Frankfurt am Main 2018.* Regensburg 2021, 259–272.

DERGACHEV, V. A. 1986

Moldavia i sosedniye territorii v epokhu bronzy. Kishinev 1986.

DERGACHEV, V. A. 2002

Die äneolithischen und bronzezeitlichen Metallfunde aus Moldavien. Prähistorische Bronzefunde XX/9. Stuttgart 2002.

DERGACHEV, V. A. – MANZURA, I. V. 1991

Pogrebalnye komplekсы позднего Tripolya. Kishinev 1991.

DOBEŠ, M. – FIKRLE, M. – DRECHSLER, A. – FALTÝNEK, K. – FOJTÍK, P. – HALAMA, J. et al. 2019

Eneolitická měděná industrie na Moravě. Nové a staronové nálezy ve světle stávajících poznatků o vývoji středoevropské metalurgie. *Památky archeologické CX* (2019) 5–58.

DURMAN, A. (ed) 1988

Vučedol – treće tisućljeće p. n. e., Three Thousand Years B.C. Zagreb 1988.

ENDRÖDI, A. 2013

Funerary Rituals, Social Relations and Diffusion of Bell Beaker Csepel-Group. In: Prieto Martínez, M. P. – Salanova, L. (eds.): *Current researches on Bell Beakers. Proceedings of the 15th International Bell Beaker Conference: From Atlantic to Ural. 5th – 9th May 2011 Poio (Pontevedra, Galicia, Spain).* Santiago de Compostela 2013, 73–88.

FITZPATRICK, A. P. 2011

The Amesbury Archer and the Boscombe Bowmen. Bell Beaker burials at Boscombe Down, Amesbury, Wiltshire. Wessex Archaeology Report 27. Wessex 2011.

FRIEDERICH, S. – HOFFMANN, V. 2013

Die Rinderbestattungen von Profen – mit Rad und Wagen. In: Meller, H. (ed.): *3300 BC. Mysteriöse Steinzeittote und ihre Welt. Halle (Saale) 2013, 83–84.*

FRÎNCULEASA, A. 2007

Contribuții privind mormintele Jamnaja din Muntenia. Cercetări arheologice la Ariceștii Rahtivani – jud. Prahova. *Tyrageția, S. N.* 1/16 (2007) 181–193.

FRÎNCULEASA, A. 2019

The Children of the Steppe: descendance as a key to Yamnaya success. *Studii de Preistorie* 16 (2019) 129–168.

FRÎNCULEASA, A. – PREDA, B. – NEGREA, O. – SOFICARU, A. D. 2013

Bronze Age tumularly graves recently investigated in northern Wallachia. *Dacia (NS)* LVII (2013) 23–63.

FRÎNCULEASA, A. – PREDA, B. – HEYD, V. 2015

Pit-Graves, Yamnaya and Kurgans along the Lower Danube: Disentangling 4th and 3rd Millennium BC Burial Customs, Equipment and Chronology. *Prähistorische Zeitschrift* 90 (2015) 45–113.

FRÎNCULEASA, A. – PREDA-BĂLĂNICĂ, B. – GARVĂN, D. – NEGREA, O. – SOFICARU, A. 2019

Towards a better understanding of the end of the Fourth Millennium BC in Northern Muntenia: The case of the Burial mound in Ploiești – Gara de vest. *Ziridava Studia Archaeologica* 33 (2019) 55–90.

FURHOLT, M. 2019

Re-integrating Archaeology: A Contribution to aDNA Studies and the Migration Discourse on the 3rd Millennium BC in Europe. *Proceedings of the Prehistoric Society* 85 (2019) 115–129.

GERLING, C. – BÁNFFY, E. – DANI, J. – KÖHLER, K. – KULCSÁR, G. – SZEVERÉNYI, V. et al. 2012

Immigration and transhumance in the Early Bronze Age Carpathian Basin: the occupants of a kurgan. *Antiquity* 334 (2012) 1097–1111.

GESSNER, K. 2005

Vom Zierrat zum Zeichen von Identitäten: Soziokulturelle Betrachtungen auf der Grundlage des endneolithischen Schmucks im Mittelelbe-Saale-Gebiet. *Ethnographisch-Archäologische Zeitschrift* 46 (2005) 1–26.

HAAK, W. – KRAUSE, J. 2020

Genomweite Daten prähistorischer Individuen aus dem Mittelelbe-Saale-Gebiet. In: Meller, H. – Schefzik, M. (eds.): *Die Welt der Himmelsscheibe von Nebra – Neue Horizonte. Landesausstellung im Landesmuseum für Vorgeschichte Halle (Saale) vom 4. Juni 2021 bis 9. Januar 2022*. Halle (Saale) 2020, 49–53.

HAAK, W. – LAZARIDIS, I. – PATTERSON, N. – ROHLAND, N. – MALLICK, S. – LLAMAS, B. et al. 2015

Massive migration from the steppe is a source for Indo-European languages in Europe. *Nature* 522 (2015) 207–211.

HARRISON, R. – HEYD, V. 2007

The Transformation of Europe in the Third Millennium BC: the example of „Le Petit-Chasseur I + III“ (Sion, Valais, Switzerland). *Prähistorische Zeitschrift* 82 (2007) 129–214.

HÄUSLER, A. 1974

Die Gräber der älteren Ockergrabkultur zwischen Dnepr und Ural. Wissenschaftliche Beiträge der Martin-Luther-Universität Halle-Wittenberg 2, Berlin 1974.

HÄUSLER, A. 1976

Die Gräber der älteren Ockergrabkultur zwischen Dnepr und Karpaten. Berlin 1976.

HÄUSLER, A. 1998

Struktur und Evolution der Bestattungssitten zwischen Wolga und Karpatenbecken vom Äneolithikum bis zur frühen Bronzezeit. Ein diachroner Vergleich. In: Hänsel, B. – Machnik, J. (eds.): *Das Karpatenbecken und die osteuropäische Steppe: Nomadenbewegungen und Kulturaustausch in den vorchristlichen Metallzeiten (4000–500 v. Chr.)*. *Südosteuropa-Schriften* 20. *Prähistorische Archäologie in Südosteuropa* 12. München-Rahden/Westf. 1998, 135–161.

HÄUSLER, A. 2004

Überlegungen über Systematisierung, Analyse und Interpretation von Körperbestattungen des Neolithikums, Äneolithikums und der Bronzezeit. *Jahresschrift für mitteldeutsche Vorgeschichte* 88 (2004) 149–217.

HEJCMAN, M. – SOUČKOVÁ, K. – KRIŠTUF, P. – PEŠKA, J. 2013

What questions can be answered by chemical analysis of recent and paleosols from the Bell Beaker barrow (2500–2200 BC). Central Moravia, Czech Republic. *Quaternary International* 316 (2013) 179–189.

HEYD, V. 2016

Das Zeitalter der Ideologien. In: Furholt, M. – Grossmann, R. – Szmyt, M. (eds.): *Transitional landscapes? The 3rd millennium BC in Europe*. Universitätsforschungen zur prähistorischen Archäologie 292. Bonn 2016, 53–85.

HEYD, V. 2017

Kossinna's smile. *Antiquity* 356 (2017) 348–359.

HEYD, V. 2019

Yamnaya – Corded Ware – Bell Beakers, or how to conceptualize events of 5000 Years ago that shaped modern Europe. In: Valchev, T. (ed.): *Studia in honorem Iliae Iliev: A jubilee collection dedicated to the 70th anniversary of Ilia Iliev. Bulletin of Regional Historical Museum in Yambol* 9. Yambol 2019, 125–136.

IVANOVA, S. V. 2012a

Istoria naseleniya Severo-Zapadnogo Prichernomorya v konce IV–III tys. do n. e. Zaporizhzhia 2012.

IVANOVA, S. V. 2012b

Ob istokakh formirovaniya Budzhakskoy kultury. In: *Starozhytnosti stepnovogo Prichernomorya i Krymu* Vol. XVI. Zaporizhzhia 2012, 18–62.

IVANOVA, S. V. 2013

Kulturno-istoricheskiye kontakty naseleniya Severo-Zapadnogo Prichernomorya v rannem bronzovom veke: Zapad-Vostok. *Stratum Plus* 2 (2013) 1–59.

IVANOVA, S. V. – TOSHCHEV, G. N. 2015

The Middle-Dniester cultural contact area of early metal age societies. The frontier of Pontic and Baltic drainage basins in the 4th/3rd–2nd millennium BC. *Baltic-Pontic Studies* 20 (2015) 336–405.

JOHANSEN, N. – NIELSEN, S. K. – JENSEN S. T. 2016

North-western Jutland at the dawn of the 3rd millennium: navigating life and death in a new socioeconomic landscape? In: Furholt, M. – Grossmann, R. – Szmyt, M. (eds.): *Transitional landscapes? The 3rd Millennium BC in Europe. Proceedings of the International Workshop „Socio-Environmental Dynamics over the Last 12,000 Years: The Creation of Landscapes III (15th–18th April 2013)“ in Kiel. Universitätsforschungen zur prähistorischen Archäologie 292. Bonn 2016, 35–51.*

JURAS, A. – CHYLEŃSKI, M. – EHLER, E. – MALMSTRÖM, H. – ŻURKIEWICZ, D. – WŁODARCZAK, P. et al. 2018

Mitochondrial genomes reveal an east to west cline of steppe ancestry in Corded Ware populations. *Scientific Reports* (2018) 8:11603, Doi:10.1038/s41598-29914-5.

KADROW, S. 2008

Settlements and subsistence strategies of the Corded Ware Culture at the beginning of the 3rd millennium BC in Southeastern Poland and in Western Ukraine. In: Dörfler, V. – Müller, J. (eds.): *Umwelt – Wirtschaft – Siedlungen im dritten vorchristlichen Jahrtausend Mitteleuropas und Südkandinaviens. Proceedings of Internationale Tagung Kiel 4.–6. November 2005. Neumünster* 2008, 243–252.

KAISER, E. 2003

Studien zur Katakombengrabkultur zwischen Dnepr und Prut. Archäologie in Eurasien 14, Mainz am Rhein 2003.

KAISER, E. 2019

Das dritte Jahrtausend im osteuropäischen Steppenraum. Kulturhistorische Studien zu prähistorischer Subsistenzwirtschaft und Interaktion mit benachbarten Räumen. Berlin Studies of the Ancient World 37, Berlin 2019.

KALÁBEK, M. – PEŠKA, J. 2006

Pozdně eneolitický hrob se zdobeným kostěným terčem z Olomouce-Nemilan. In: Bém, M. – Peška, J. (eds.): *Ročenka 2005*. Olomouc 2006, 72–107.

KALICZ, N. 1968

Die Frühbronzezeit in Nordost-Ungarn. Budapest 1968.

KERIG, T. 2010

Ein Statuenmenhir mit Darstellung einer Axt vom Eschollbrückener Typ? Zu einem enigmatischen Steindenkmal aus Gelnhausen-Merrholz (Mainz-Kinzig-Kreis). *Prähistorische Zeitschrift* 85 (2010) 59–78.

KIBBERT, K. 1980

Die Äxte und Beile im mittleren Westdeutschland I. Prähistorische Bronzefunde IX/10. München 1980.

KLOCHKO, V. 2017

Yamnaya culture hoard of metal objects, Ivanivka, Lower Murafa: Autogenesis of „Dniester copper/bronze metallurgy”. *Baltic-Pontic Studies* 22 (2017) 226–245.

KOLÁŘ, J. 2018

Archaeology of Local Interactions. Social and Spatial Aspects of the Corded Ware Communities in Moravia. Bonn 2018.

KOLÁŘ, J. et al. 2011

Kultura se šňůrovou keramikou v povodí říčky Hané na střední Moravě. Pohřební areály z prostoru dálnice D1 v úseku Vyškov – Mořice a dalších staveb. Pravěk – Supplementum 23. Brno 2011.

KOLEDIN, J. – BUGAJ, U. – JAROSZ, P. – NOVAK, M. – PRZYBYŁA, M. – PODSIADŁO, M. et al. 2020

First archaeological investigations of barrows in the Bačka region and the question of the Eneolithic/Early Bronze Age barrows in Vojvodina. *Prähistorische Zeitschrift* 95 (2020) 350–375.

KOROŠEC, P. – KOROŠEC, J. 1969

Najdbe s koliščarskih naselbin pri Igu na ljubljanskem barju. Fundgut der Pfahlbausiedlungen bei Ig am Laibacher Moor. Catalogi archaeologici Sloveniae Vol. III. Ljubljana 1969.

KOS, P. 2011

Halštatské hroby z Hrušovan u Brna. In: Korený, R. (ed.): *Doba popelnicových polí a doba halštatská. Příspěvky z XI. Konference Příbram 7.–10. 9. 2010. Podbrdsko – Miscelanea 2*. Příbram 2011, 173–183.

KOS, P. – PŘICHYSTAL, M. 2013

Doba halštatská. In: Geislerová, K. – Parma, D. (eds.): *Výzkumy 2005–2010*. Brno 2013, 74–94.

KOTOVA, N. 2010

The First „Corded“ Ceramics Ornamentation of Eneolithic Steppe and Neolithic Forest-Steppe Cultures. *Baltic-Pontic Studies* 15 (2010) 75–109.

KRÁLÍK, M. – PEŠKA, J. – KALÁBEK, M. – URBANOVÁ, P. – MOŘKOVSKÝ, T. et al. 2006

Předběžná analýza kosterních pozůstatků a hrobové výbavy jedince kultury lidu se šňůrovou keramikou z lokality Olomouce-Nemilan, ulice Lidická (Nemilany 4). In: Bém, M. – Peška, J. (eds.): *Ročenka 2005*. Olomouc 2006, 108–145.

KRISTIANSEN, K. 1989

Prehistoric migration – the case of the Single Grave and Corded Ware cultures. *Journal of Danish Archaeology* 8 (1989) 211–225.

KRISTIANSEN, K. – ALLENTOLT, M. E. – FREI, K. – IVERSEN, R. – JOHANNSEN, N. – KROONEN, G. et al. 2017

Re-theorising mobility and the formation of culture and language among the Corded Ware Culture in Europe. *Antiquity* 91 (2017) 334–347.

LAMBOT, B. 2018

Conducteurs de char et cavaliers Gaulois en Champagne aux V^e et IV^e s. avant J.-C., Découvertes récentes. Champagne 2018.

LARINA, O. – MANZURA, I. – CHACHEY, V. 2008

Brevichenskiye kurgany. Kishinev 2008.

LAZARIDIS, I. – PATTERSON, N. – MITTNIK, A. – RENAUD, G. – MALLICK, S. – KIRSANOW, K. et al. 2014

Ancient human genomes suggest three ancestral populations for present-day Europeans. *Nature* 513 (2014) 409–413.

LICHARDUS, J. – VLADÁR, J. 1996

Karpatenbecken-Sintašta-Mykene. Ein Beitrag zur Definition der Bronzezeit als historischer Epoche. *Slovenská Archeológia* XLIV (1996) 25–93.

MAKHARADZE, Z. 2016

Ananauri big kurgan N°3. In: Makharadze, Z. – Kalandadze, N. – Murvanidze, B. (eds.): *Ananauri big kurgan 3*. Tbilisi 2016, 27–112.

MANSFELD, G. 2005

Das frühbronzezeitliche Grab von Korinto/Achalgori und seine weitreichenden Beziehungen (Überlegungen zum Phänomen der Hammerkopfnadeln). *Metalla* 12 (2005) 23–68.

MANZURA, I. 1993

The East-West Interaction in the Mirror of the Eneolithic and Early Bronze Age Cultures in the North-West Pontic. *Revista Arheologică I* (1993) 23–53.

MANZURA, I. 2009

Unter den Fittichen der fremden Götter. In: Apakidze, J. – Govedarica, B. – Hänsel, B. (eds.): *Der Schwarzmeerraum vom Äneolithikum bis in die Früheisenzeit (5000 – 500 v. Chr.). Kommunikations-ebenen zwischen Kaukasus und Karpaten. Internationale Fachtagung von Humboldtianern für Humboldtianer im Humboldt-Kolleg in Tiflis/Georgien (17.–20. Mai 2007)*. Prähistorische Archäologie in Südosteuropa 25. Rahden/Westf. 2009, 74–90.

MARAN, J. 2008

Zur Zeitstellung und Deutung der Kupferäxte vom Typ Eschollbrücken. In: Falkenstein, F. – Schade-Lindig, S. – Zeeb-Lanz, A. (eds.): *Kumpf, Kalotte, Pfeilschaftglätter: Zwei Leben für die Archäologie. Gedenkschrift für Annemarie Häusser und Helmut Spatz*. Rahden/Westf. 2008, 173–187.

MATHIESON, I. – LAZARIDIS, I. – ROHLAND, N. – MALLICK, S. – PATTERSON, N. – ALPASLAN, S. et al. 2015

Genome-wide patterns of selection in 230 ancient Eurasians. *Nature* 528 (2015) 499–503.

MISCHKA, D. 2011

The Neolithic burial sequence at Flintbek LA3, north Germany, and its cart tracks: a precise chronology. *Antiquity* 85 (2011) 742–758.

MÍROVÁ, Z. 2019

The horse in the Bronze and Iron Age in Moravia. Archaeologica Olomucensia T. III, Olomouc 2019.

MÍROVÁ, Z. – GOLEC, M. 2018

Hallstatt Magnate Graves from Brno-Holásky 1 and 2 in the Central European Context. Archaeologiae Regionalis Fontes 13. Olomouc 2018.

MORGUNOVA, N. L. 2011

Pit-Grave culture of the south near the Ural Mountains. In: Petö, A. – Barczi, A. (eds.): *Kurgan Studies: An Environmental and Archaeological Multiproxy Study of Burial Mounds in the Eurasian Steppe Zone*. BAR International Series 2238. Oxford 2011, 133–143.

MORGUNOVA, N-L. – GOLYEVA, A. A. – DEGTYAREVA A. D. – EVGENIEV, A. A. – KUPTSOVA, L. V. – SALUGINA, N. P. et al. 2010

Skvortsovskiy kurgannyi mogilnik. Orenburg 2010.

MOUCHA, V. 1981

Eneolitický sluneční symbol z Hřivic na Lounsku. *Praehistorica* VIII (1981) 81–84.

NEUSTUPNÝ, E. 2008

Kultura se šňůrovou keramikou. In: Neustupný, E. (ed.) *Archeologie pravěkých Čech /4 Eneolit*. Praha 2008, 124–147.

NEUSTUPNÝ, E. – SMRŽ, Z. 1989

Čachovice – pohřebiště kultury se šňůrovou keramikou a zvoncovitých pohárů. *Památky archeologické* LXXX (1989) 282–383.

NOVOTNÁ, M. 1981

Zur Stellung und Funktion einiger Typen der Bronzeindustrie in der älteren Bronzezeit. In: *IX. Internationales Symposium über das Äneolithikum und die Bronzezeit im Donauegebiet*. Nitra – Nové Vozokany 8.–12. Oktober 1979, SIA XXIX, 1981, 121–129.

NOVOTNÁ, M. 1984

Halsringe und Diademe in der Slowakei. Prähistorische Bronzefunde XI/4, München 1984.

NOVOTNÁ, M. 2006

Zur Deutung der Bronzefundstücke aus den Höhensiedlungen. In: Krenn-Leeb, A. (ed.): *Wirtschaft, Macht und Strategie – Höhensiedlungen und ihre Funktionen in der Ur- und Frühgeschichte*. *Archäologie Österreichs Spezial 1*. Wien 2006, 3–22.

OLALDE, I. – BRACE, S. – ALLENTOLT, M. E. – ARMIT, I. – KRISTIANSEN, K. – BOOTH, T. et al. 2018

The Beaker phenomenon and the genomic transformation of Northwest Europe. *Nature* 555 (2018) 190–196.

OLALDE, I. – MALLICK, S. – PATTERSON, N. – ROHLAND, N. – VILLALBA-MOUCO, V. – SILVA, M. et al. 2019

The genomic history of the Iberian Peninsula over the past 8000 years. *Science* 363 (2019) 1230–1234.

ONDŘÁČEK, J. 1965

Jihovýchodní vlivy v moravské šňůrové keramice. *Archeologické rozhledy* 17 (1965) 770–782.

PANAYOTOV, I. 1989

Jamnata kultura v bolgarskite zemi. Razkopki i proucivaniya 21. Sofia 1989.

PAPAC, L. – ERNÉE, M. – DOBEŠ, M. – LANGOVÁ, M. – ROHRLACH, A. B. – ARON, F. et al. 2021

Dynamic changes in genomic and social structures in third millennium BCE central Europe. *Science Advances* 7(35) (2021) eabi6941. doi:10.1126/sciadv.abi6941

PARE, C. F. E. 1992

Wagons and Wagon-Graves of the Early Iron Age in Central Europe. Oxford University Committee for Archaeology, Monograph No. 35. Oxford 1992.

PARZINGER, H. 2010

Mitteleuropa und der eurasische Steppenraum während der Frühbronzezeit. In: Meller, H. – Bertemes, F. (eds.): *Der Griff nach den Sternen. Wie Europas Eliten zu Macht und Reichtum kamen. Internationales Symposium in Halle (Saale) 16.–21. Februar 2005*. Tagungen des Landesmuseums für Vorgeschichte Halle (Saale) Band 5. Halle (Saale) 2010, 699–710.

PATAY, R. 2013

Bell Beaker Cemetery and Settlement at Szigetszentmiklós: First Results. In: Heyd, V. – Kulcsár, G. – Szeverényi, V. (eds.): *Transitions to the Bronze Age. Interregional Interaction and Socio-Cultural Change in the Third Millennium BC Carpathian Basin and Neighbouring Regions*. Archaeolingua 30. Budapest 2013, 287–317.

PEŠKA, J. 2002

Hrob kultury se šňůrovou keramikou s vnitřní konstrukcí z Bystročic u Olomouce. *Pravěk* NŘ 11/2001. Brno (2002) 131–161.

PEŠKA, J. 2004a

Zlaté ozdoby z hrobů kultury se šňůrovou keramikou na Moravě. In: Bátora, J. – Furmánek, V. – Veliačik, L. (eds.): *Einflüsse und Kontakte alteuropäischer Kulturen. Festschrift für Jozef Vladár zum 70. Geburtstag*. Archaeologica Slovaca Monographiae. Tomus VI. Nitra 2004, 93–138.

PEŠKA, J. 2004b

Žárové hroby kultury se šňůrovou keramikou na Moravě. In: Kazdová, E. – Měřínský, Z. – Šabatová, K. (eds.): *K počtě Vladimíru Podborskému. Přátelé a žáci k sedmdesátým narozeninám*. Brno 2004, 191–205.

PEŠKA, J. 2011

Nové poznatky o jevišovickém osídlení v regionu střední Moravy. In: Popelka, M. – Šmidtová, R. (eds.): *Otázky neolitu a eneolitu našich zemí. Sborník referátů z 28. zasedání badatelů pro výzkum neolitu a eneolitu (nejen) Čech, Moravy a Slovenska, Mělník 28. 9. – 1. 10. 2009*. Praehistorica XXIX. Praha 2011, 297–322.

PEŠKA, J. 2013

Morava na sklonku eneolitu. Olomouc. Akademické nakladatelství CERN.

PEŠKA, J. 2016

Graves of metallurgists in the Moravian Beaker Cultures. In: Guerra Doce, E. – Liesau von Lettow-Vorbeck, C. L. (eds.): *Analysis of the economic foundations supporting the social supremacy of the*

Beaker Groups. Proceedings of the XVII UISPP World Congress (1–7 September, Burgos, Spain). Archeopress Archaeology. Oxford 2016, 1–18.

PEŠKA, J. 2017

Nová pohřebiště kultury se šňůrovou keramikou na střední Moravě. (Dosavadní výsledky horizontální stratigrafie). *Přehled výzkumů* 58/1 (2017) 19–47.

PEŠKA, J. 2021

East European Elements in Burial Rites of Moravian Corded Ware Culture. Wagon Burial in Moravia in the 3rd Millennium BC? In: Heyd, V. – Kulcsár, G. – Preda-Bălănică, B. (eds.): *Yamnaya Interactions. Proceedings of the International Workshop held in Helsinki, 25th–26th April 2019. The Yamnaya Impact in Prehistoric Europe*, vol. 2. Budapest 2021, 513–544.

PEŠKA, J. 2022

Die soziale Stratifikation am Ende des Äneolithikums in Mähren. *Praehistorische Zeitschrift* 97/2 (2022) 495–521. <https://doi.org/10.1515/pz-2022-2048>

PEŠKA, J. – TAJER, A. 2006

První kostrový hrob jevišovické kultury na Moravě? In: Bém, M. – Peška, J. (eds.): *Ročenka 2005. Olomouc 2006*, 35–52.

PEŠKA, J. – TAJER, A. 2007

Hrob KZP s nadzemní konstrukcí a zlatem ze Stříbrnic. In: Bém, M. – Peška, J. (eds.): *Ročenka 2006. Olomouc 2007*, 67–87.

PEŠKA, J. – TAJER, A. 2009

Příspěvek k poznání jevišovického osídlení na střední Moravě. In: Bém, M. – Peška, J. (eds.): *Ročenka 2008. Olomouc 2009*, 59–107.

PEŠKA, J. – VRÁNA, J. 2017

Menší sídliště nositelů kultury kulovitých amfor na katastru Radvanic, okres Přerov. In: Kršková, M. – Peška, J. (eds.): *Ročenka. Archeologické centrum Olomouc. Olomouc 2016*, 57–74.

PEŠKA, J. – FOJTÍK, P. – DAŇHEL, M. 2021

Settlements of Local Phase of Corded Ware Culture in Moravia. *Acta Archaeologica Carpathica* 56 (2021) 193–220.

PIGGOTT, S. 1983

The Earliest Wheeled Transport. From the Atlantic Coast to the Caspian Sea. London 1983.

POLIN, S. V. – CHERNYKH, L. A. 2009

Konstruktivniye osobennosti pervuchnykh nasypey yamnykh kurganov u s. Vladimirovki i u s. Ordzhonikidze. In: *Problemy arkheologii Podniprovyia. Naukoviy mizhvyzivskiy zbirnik z problem arkheologii, davnoy istorii ta etnografii.* Dnipropetrovsk 2009, 37–47.

PRIMAS, M. 1996

Velika Gruda I. Hügelgräber des frühen 3. Jahrtausends v. Chr. im Adriagebiet – Velika Gruda, Mala Gruda und ihr Kontext. Universitätsforschungen zur Prähistorischen Archäologie 32. Bonn 1996.

REINHOLD, S. – GRESKY, J. – BEREZINA, N. – KANTOROVICH, R. – KNIPPER, C. – MASLOV, V. E. et al. 2017

Contextualising Innovation: Cattle Owners and Wagon Drivers in the North Caucasus and Beyond. In: Maran, J. – Stockhammer, P. (eds.): *Appropriating Innovations: Entangled Knowledge in Eurasia, 5000–150 BCE.* Oxford 2017, 78–97.

REZEPKIN, A. D. 2000

Das frühbronzezeitliche Gräberfeld von Klady und die Majkop-Kultur in Nordwestkaukasien. Archäologie in Eurasien 10. Rahden/Westf 2000.

ROMAN, P. 1974

Das Problem der „schnurverzierten“ Keramik in Südosteuropa. *Jahresschrift für Mitteldeutsche Vorgeschichte* 58 (1974) 157–174.

ROMAN, P. – DODD-OPRIȚESCU, A. – JÁNOS, P. 1992

Beiträge zur Problematik der schnurverzierten Keramik Südosteuropas. Internationale Interakademische Kommission für die Erforschung der Vorgeschichte des Balkans. Monographien III. Mainz am Rhein 1992.

RUTTKAY, E. 2002

Das endneolithische Hügelgrab von Neusiedl am See, Burgenland. Zweite Vorlage – Teil I – Die Fazies Neusiedl. *Budapest Régiségei* XXXVI (2002) 145–169.

RUTTKAY, E. 2003

Das endneolithische Hügelgrab von Neusiedl am See, Burgenland. Zweite Vorlage – II. Kulturgeschichtliche Aspekte des Zentralgrabes. In: Jerem, E. – Raczky, P. (eds.): *Morgenrot der Kulturen. Frühe Etappen der Menschheitsgeschichte in Mittel- und Südosteuropa. Festschrift für Nándor Kalicz zum 75. Geburtstag.* Budapest 2003, 445–474.

SCHIRMEISEN, K. 1936

Fundnachrichten aus Mähren. *Nachrichtenblatt für Deutsche Vorzeit* XII (1936) 10–19.

SCHMIDT, R. 1945

Die Burg Vučedol. Zagreb 1945.

SHERRATT, A. 1997

Plough and Pastoralism: Aspects of the Secondary Products Revolution. In: Hodder, I. – Isaac, G. – Hammond, N. (eds.): *Pattern of the Past: studies in honour of David Clarke.* (Cambridge 1981). Reprint in: Sherratt, A. *Economy and Society in Prehistoric Europe: Changing Perspectives.* Edinburgh 1997, 261–305.

SHERRATT, A. 2003

The Baden (Pécel) Culture and Anatolia: Perspectives on a cultural transformation. In: Jerem, E. – Raczky, P. (eds.): *Morgenrot der Kulturen. Frühe Etappen der Menschheitsgeschichte in Mittel- und Südosteuropa. Festschrift für Nándor Kalicz zum 75. Geburtstag.* Budapest 2003, 415–429.

SHERRATT, A. 2004

Wagen, Pflug, Rind: ihre Ausbreitung und Nutzung – Probleme der Quelleninterpretation. In: Fansa, M. – Burmeister, S. (eds.): *Rad und Wagen. Der Ursprung einer Innovation. Wagen im Vorderen Orient und Europa.* Wissenschaftliche Begleitschrift zur Sonderausstellung im Landesmuseum für Natur und Mensch Oldenburg. Mainz 2004, 409–428.

SHISHLINA, N. I. 2001

Early Herders of the Eurasian Steppe. *Expedition* 43/1 (2001) 21–28.

SHISHLINA, N. I. 2008

Reconstruction of the Bronze Age of the Caspian Steppes: Life Styles and Life Ways of Pastoral Nomads. British Archaeological Reports International Series 1876. Oxford 2008.

SHISHLINA, N. I. – TSUTSKIN, E. V. – FIRSOV, K. B. 2001

Arkheologicheskoe issledovaniye mogilnikov Mu-Sharet v Iki-Burulskom rayone Respubliki Kalmykia. In: Tsutskin, E. V. – Shishlina, N. I. (eds.): *Mogilnik Mu-Sharet v Kalmykii: kompleksnoy issledovaniye: nauchnoe izdaniye*. Moskva 2001, 11–73.

STUCHLÍK, S. 2000

Únětická kultura a epišňůrový kulturní okruh na Moravě. In: Rydzewski, J. (ed.): *150 lat Muzeum Archeologicznego w Krakowie*. Kraków 2000, 281–296.

SULIMIRSKI, T. 1961

Copper Hoard from Horodnica on the Dniester. *Mitteilungen der Anthropologischen Gesellschaft in Wien* XCI (1961) 91–97.

SZMYT, M. 2009

Eastern European destinations of Central European cultural patterns. The case of Globular Amphora culture (end of the 4th – middle of the 3rd millennium BC). *Baltic-Pontic Studies* 14 (2009) 232–251.

ŠEBELA, L. 1986

Postavení kultury se šňůrovou keramikou v moravském eneolitu a její vztah k vývoji v Karpatské kotlině, I–III. Manuscript of Candidate Dissertation. Brno 1986.

ŠEBELA, L. 1999

The Corded Ware Culture in Moravia and the adjacent part of Silesia (Catalogue). *Fontes Archaeologiae Moraviae* XXIII. Brno: Archeologický ústav AV ČR. Brno 1999.

ŠMÍD, M. 1998

Príspevek k poznání pohřebního ritu kultury se šňůrovou keramikou na Moravě. In: *Otázky neolitu a eneolitu našich zemí. Sborník referátů z 16. pracovního setkání badatelů pro výzkum neolitu a eneolitu Čech, Moravy a Slovenska. Lázňě Sedmihorky 23.–25. září 1997*. Turnov–Hradec Králové 1998, 123–135.

ŠMÍD, M. 2000

Hudební nástroj jako součást výbavy hrobu kultury se šňůrovou keramikou z Kostelce na Hané. *Pravěk* NŘ 9 Brno 1999 (2000) 197–209.

TUREK, J. – PEŠKA, J. – MATĚJÍČKOVÁ, A. 2011

Visible and invisible monuments. Late Eneolithic Burial Mounds in Forested Areas of Central Moravia. In: Borgna, E. – Müller-Celka, S. (eds.): *Ancestral Landscapes. Burial mounds in the Copper and Bronze Ages (Central and Eastern Europe – Balkans – Adriatic – Aegean, 4th–2nd millennium B.C.). Proceedings of the International Conference held in Udine. May 15th–18th 2008*. *Travaux de la Maison de l'Orient et de la Méditerranée* 58. Lyon 2011, 107–117.

VLADÁR, J. – WIEDERMANN, E. 2020

The World behind the World. Intercultural Processes in the Prehistory of European Civilization. *Geschichte – Erinnerung – Politik* 30. Berlin 2020.

VULPE, A. 1970

Die Äxte und Beile in Rumänien I. Prähistorische Bronzefunde. Abteilung 9. Band 2. München 1970.

WŁODARCZAK, P. 2006

Kultura ceramiki sznurowej na wyżynie Małopolskiej. Kraków 2006.

WŁODARCZAK, P. 2008

Kultura złocka i problem genezy kultury ceramiki sznurowej w Małopolsce. In: Bednarczyk, J. – Czebreszuk, J. – Makarowicz, P. – Szmyt, M. (eds.): *Na pograniczu światów. Studia z pradziejów*

międzymorza bałtycko-pontyjskiego ofiarowane Profesorowi Aleksandrowi Koško w 60. rocznicę urodzin. Poznań 2008, 555–576.

WŁODARCZAK, P. 2017

Kurgan rites in the Eneolithic and Early Bronze Age Podolia in light of materials from the funerary-ceremonial centre at Yampil. *Baltic-Pontic Studies* 22 (2017) 246–283.

WRÓBEL, H. 1985

Nowe odkrycia grobów kultury ceramiki sznurowej w Sandomierskiem. *Sprawozdania Archeologiczne* 37 (1985) 45–49.

ZÁPOTOCKÝ, M. – ZÁPOTOCKÁ, M. 2008

Kutná Hora-Denemark. Hradiště řivnáčské kultury (ca 3000–2800 př. Kr.). Památky archeologické – Supplementum 18. Praha 2008.

ZBENOVICH, V. G. 1974

Pozdnetripolskiye plemena severnogo Prichernomorya. Kiev 1974.

ZIMMERMANN, T. 2007

Die ältesten kupferzeitlichen Bestattungen mit Dolchbeigabe. Monographien des Römisch-Germanischen Zentralmuseums Band 71. Mainz 2007.

The Emergence of the Corded Ware Culture in Northern Central Europe

SEBASTIAN SCHULTRICH

Abstract

Advances in biochemical studies have revived old narratives for the emergence of the Corded Ware Culture in the early 3rd millennium BC. The studies offer only simple and monocausal explanations for the transformations. Fundamental is the assumption that a cultural break occurred with the onset of this archaeological culture. However, in northern Central Europe, many cultural continuities appear that contest these simple explanations. From the local perspective of northernmost Germany, the land use remained stable, many megaliths were re-used regularly and even a causewayed enclosure was re-used. Furthermore, a regional perspective shows that other supposed Corded Ware features are already present in the Late Neolithic. In addition to individual graves, we can identify individualised burials within collective graves as well as a war-like social identity already. Moreover, there was a supra-regional consensus concerning the battle-axe idea. The number of battle-axes from burials increases significantly during the Late Neolithic and thus before the onset of the Corded Ware Culture. From a northern German perspective, we cannot identify a cultural break that indicates a new ideology or even a new population. Already existing super-regional networks and identities during the Late Neolithic facilitated the expansion of Corded Ware symbols and new ancestries at the onset of the Final Neolithic.

Key words: battle-axes, Late Neolithic, Final Neolithic, Funnel Beaker Culture, Corded Ware Culture, Single Grave Culture, North Germany, collective graves, warrior identity

Introduction

Recent biochemical (aDNA and strontium isotope) analyses clearly show that migrations happened in the 3rd millennium BC in Central Europe (HAAK *et al.* 2015; SJÖGREN – PRICE – KRISTIANSEN 2016; KRISTIANSEN *et al.* 2017; EGFJORD *et al.* 2021). However, these studies put forward simple and monocausal explanations for the cultural change during the transition from the Late Neolithic (LN; c. 3500–2800 BC) to the Final Neolithic (FN; c. 2800–2200 BC). They revived old ideas of large-scale migrations, violent conquests, the spread of illnesses, a passive role of females and that archaeological cultures represent coherent people sharing the same identity (e.g. GLOB 1944; GIMBUTAS 1976). However, the interpretation of the data is much more complicated (cf. HEYD 2017; FURHOLT 2019; 2021; KOLÁŘ 2020). The simple explanations are based on top-down approaches. They neglect the archaeological knowledge gathered in the last decades and throw it back to “textbook narratives” as noted by FURHOLT (2019, 116–117). On the other hand, we must accept that the ancestral composition changes fundamentally in the 3rd millennium BC. Increasing evidence demonstrates that LN and FN individuals are genetically different (IMMEL *et al.* 2020; PAPAC *et al.* 2021). However, the initial idea of one and one-sided migration event does not stick (HEYD 2021; FURHOLT 2021; DRUMMER 2022).

Combining the archaeological and genetic evidence into one model is not similarly possible in each region. In some areas, such as Northern Germany, bone preservation is bad. Accordingly, our knowledge of the genetic structure remains unclear. Here, conventional archaeology is still the best way

to evaluate the transformation. To understand the processes in this period, we have to acknowledge the regional diversity by using bottom-up approaches (cf. FURHOLT 2019; KOLÁŘ 2020). Recent examples of regional studies are BECKERMANN (2015), IVERSEN (2015), KOLÁŘ (2020) and DRUMMER (2022). Although these studies are based on very diverse approaches, they all testify to continuities in LN and FN traditions (see discussion). In this paper, we add another local and regional perspective.

Due to many recent studies, today Schleswig-Holstein (SH) is very suited for a detailed analysis. In this paper, I first highlight several aspects of continuity from this local perspective. This overview is followed by a broader, regional perspective that is based on re-examinations of LN collective burials and battle-axes. In Central Europe, collective burials appear in many regions. Scholars tend to associate these burials with a similar ideology of collectivism, although there are regional and temporal differences. This generalisation prevents identifying significances that remind of later individual burial rites. For LN battle-axes, ZÁPOTOCKÝ's (1992) study is still the main source. However, many of his ideas need to be re-evaluated, especially some chronological assumptions. This gives new perspectives on both social changes and continuities in the Neolithic period. At the end of this paper, I attempt to combine the genetic and archaeological evidence into one model for Northern Germany.

Local perspective: Schleswig-Holstein

For Schleswig-Holstein¹, most scholars accept that the emergence of the Single Grave Culture (henceforth SGC), the local variant of the Corded Ware Culture (henceforth CWC), was associated with a massive cultural upheaval (e.g. GLOB 1944; STRUVE 1955; DAMM 1991; HÜBNER 2005; KRISTIANSEN *et al.* 2017). However, they projected many of the arguments for this from Danish observations onto SH. In this paper, an independent examination of the burial findings from SH and related observations will show that this general transfer of assumptions is not adequate. Generally spoken, during the LN, the Funnel Beaker culture (FBC) built and used megalithic tombs, while, during the FN, the SGC buried their deceased in single graves under low barrows (HÜBNER 2005, 467). Both in Denmark and SH, LN megaliths are more frequently documented in the east than in the west (FURHOLT 2012, 125). In contrast, early burial mounds of the SGC mainly occur in the west (HÜBNER 2005, 655–656). Generally, the interpretation of this contrasting pattern of distribution is that the SGC intentionally avoided former areas of the FBC (DAMM 1991, 202; FURHOLT 2012, 125).

However, SH differs from Denmark in many aspects. In SH, a relatively large number of megaliths do occur in the west. Accordingly, LN and FN burials overlap spatially (*Fig. 1*; cf. DIBBERN 2016, 164–165). Generally, scholars assume that the ancient megaliths were re-used during the late SGC (GLOB 1944, 189–190; HÜBNER 2005, 658; IVERSEN 2015, 79). However, the megaliths in SH were regularly re-used by the SGC already in an early phase (*Fig. 1*; cf. SCHULTRICH 2018, 35–38, 213–219). This indicates that the SGC did not intentionally separate itself from the FBC. Thus, assumptions that are valid in Denmark do not apply to SH. On the Danish Islands, there are far more attributes of late SGC than of the early SGC, while on the mainland the early phase is better represented. That indicates a kind of gradual “migration” from west to east (GLOB 1944; EBBESEN 2006; IVERSEN 2015, 46–51, 93). This assumption, too, has been transferred to SH without differentiation. In SH, however, many single finds of the early SGC (especially battle-axes) are indeed found from the east (*Fig. 2*). Grave finds, especially those with battle-axes, are rare in the east during the entire FN and not only in the early phase. Based on flint daggers and bronze axes, this pattern is even still present during the subsequent Early Bronze

¹ Adjoining Jutland to the north, the federal state of Schleswig-Holstein forms the southern part of the Cimbric Peninsula.

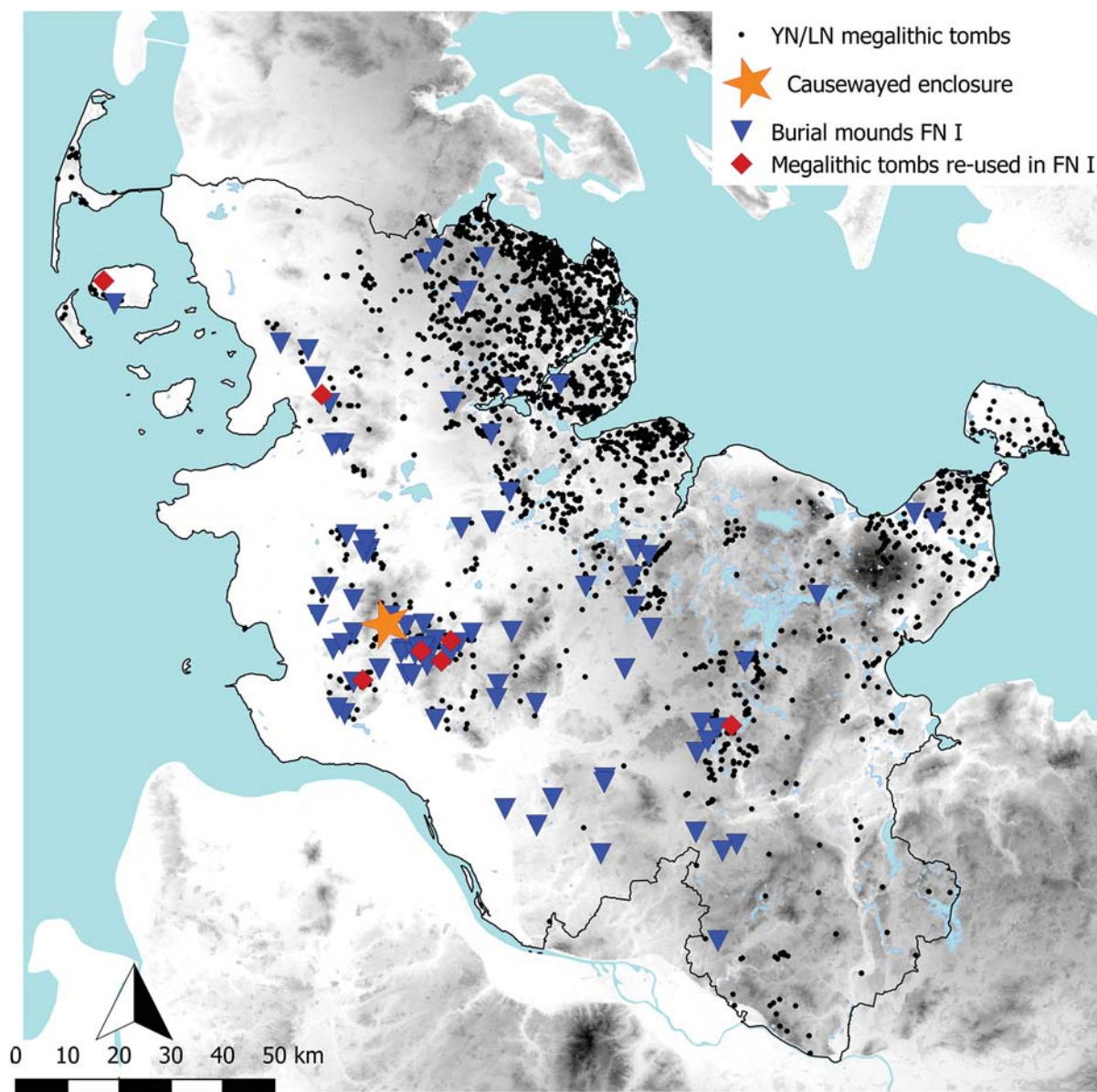


Fig. 1. Distribution of relevant Younger Neolithic, Late Neolithic and early Final Neolithic burials in Schleswig-Holstein. Note the spatial overlap of newly erected and re-used burials in the west, where also the re-used causewayed enclosure is located. Illustration: S. Schultrich

Age (EBA; c. 2250–1700 BC) (SCHULTRICH 2018, 247–254). Thus, grave finds with certain symbolic artefacts are frequent in the west, but rare in the east during the entire FN and the EBA. Single finds, on the other hand, occur frequently in the east in all periods. Accordingly, there is a structural difference between the west and the east, but we cannot reconstruct a gradual “migration”.

Many scholars emphasise that a new economy and a new settlement system accompanied the emergence of the CWC (GLOB 1944; STRUVE 1955; KLASSEN 2008). FN settlements were allegedly restricted to the west, as the poorer soils on the Old Drift of the Saale glaciation were supposedly more suitable for cultivating barley. In addition, the west was supposedly better suited for transhumant pasture farming. Wheat, in contrast, which is considered the typical FBC cereal, thrived better in the east on the

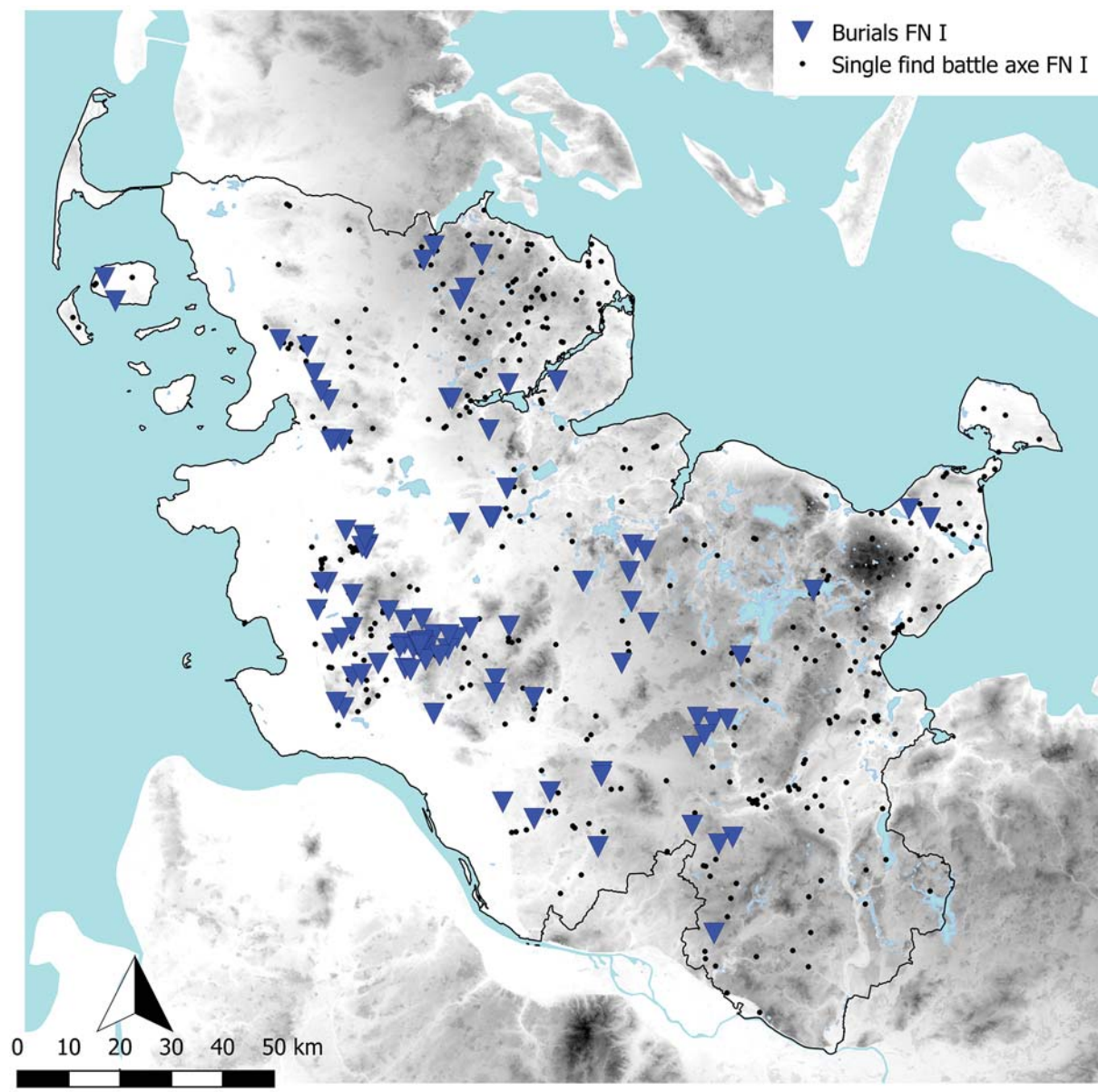


Fig. 2. Distribution of early Final Neolithic burials and single finds of battle-axes in Schleswig-Holstein. Note the presence of battle-axes in the eastern part of the region, known for its lack of burials.
Illustration: S. Schultrich

moraines of the Weichselian glaciation (GLOB 1944; STRUVE 1955; KLASSEN 2008, 59–60; cf. MØBJERG – MOSE JENSEN – HAMBRO MIKKELSEN 2007, 27). Today, with modern techniques, soils in the east yield more than in the west. However, this is not transferable to the Neolithic and the methods employed during that time (cf. HECHT 2007, 193–194). In contrast, presumably both the FBC and the SGC used sandy soils for cultivation (KLASSEN 2008, 59–60; cf. SHERRATT 2004, 422). Furthermore, we observe not only in SH but also regionally that significant changes in settlement and subsistence patterns already occurred during the late LN. At this time, the large settlement agglomerations were abandoned (HAGE 2016, 195–197). The settlements were henceforth smaller and dispersed (BROZIO 2016, 116). The pollen diagrams show that changed handling of the environment began in the late 4th millennium BC. Although

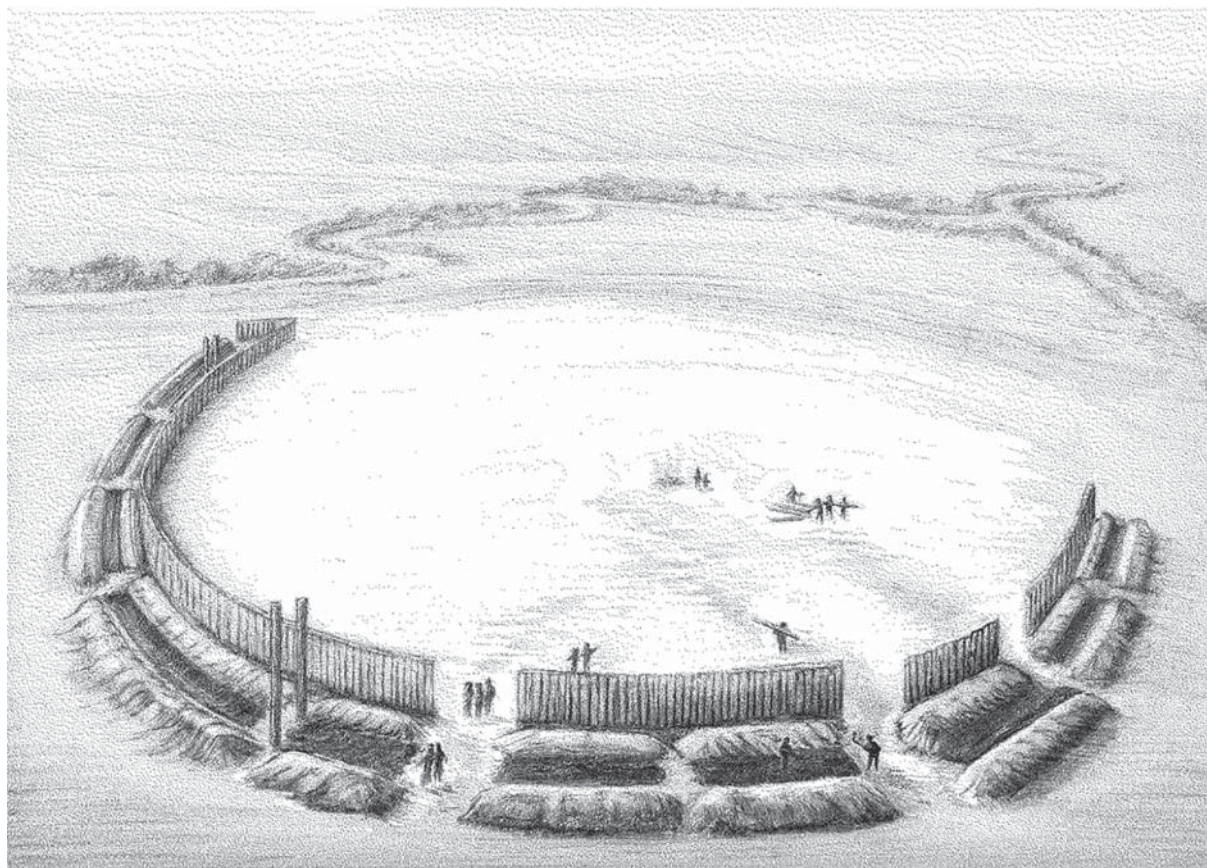


Fig. 3. Reconstruction of the Albersdorf-Dieksknöll enclosure under construction in its early phase.

Illustration: S. Beyer

landscape uses in western and eastern SH were different, they were each stable at the transition from the LN to the FN (FEESER *et al.* 2012, 185–187; FEESER–DÖRFLER 2016, 23; BROZIO 2016, 185).

On the Danish Islands, megalithic tombs were used quite often during the late LN (IVERSEN 2015, 77–79). In SH and Jutland, on the other hand, late LN pottery lack in the burials, indicating that the megalithic graves were already out of use during the late LN (JENSEN 2001, 383).² An important finding concerning the evaluation of potential cultural continuities is supplied by the Albersdorf-Dieksknöll enclosure (Fig. 3).

In northern Central Europe, there are two types of enclosures. Causewayed enclosures, which were built in the early to middle 4th millennium BC, consist of one or two surrounding ditch systems. Palisade enclosures, which were erected in the early 3rd millennium BC, do not possess surrounding ditches, but one or more palisades. They occur on Zealand, Bornholm and in Scania only (KLATT 2009, 67–70; LARSSON 2012, 110–118; IVERSEN 2015, 69). Causewayed enclosures were places of collective activity. People re-used them cyclically, but with intervals of several generations (Fig. 4). Among other activities, we can reconstruct several re-cuts of the ditches, artefact depositions and fire sets in the ditches. The installation and re-cuttings required the labour of many participants and the knowledge was transferred orally over generations. This shows that enclosures were important places for the societies related to a specific world-view (LARSSON 2012, 119; MÜLLER 2018, 9–10).

² However, a shift in burial rituals may bias this observation. In the so-called cattle burials of the late LN, pottery does not occur frequently, whereas flint axes do (JENSEN 2001, 398–402).

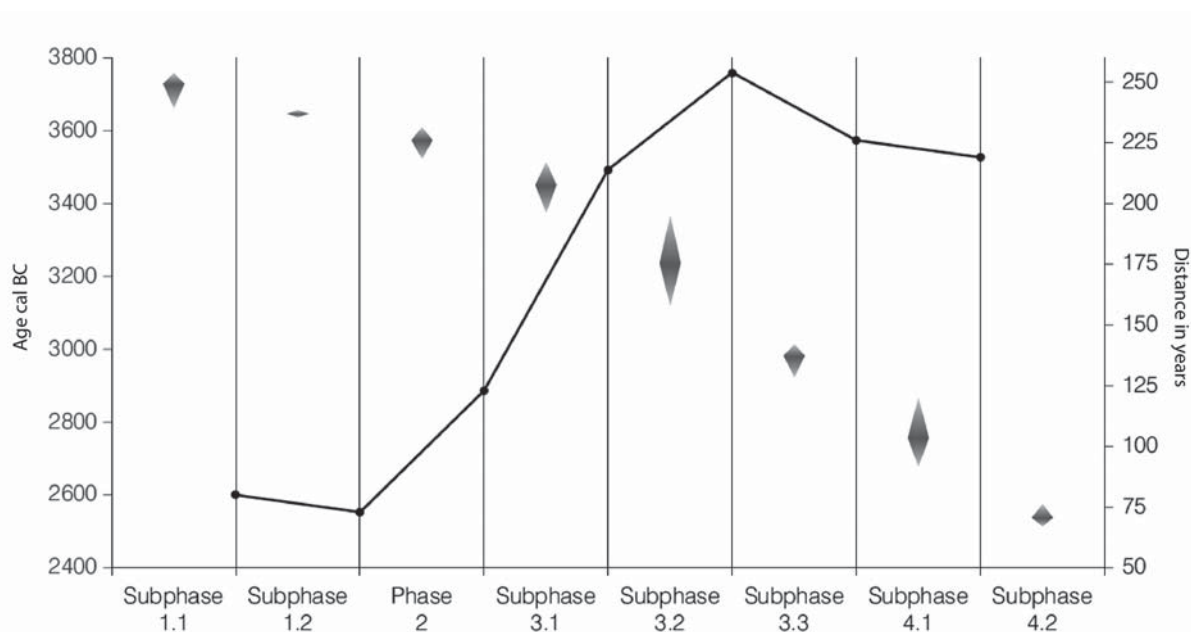


Fig. 4. Chronological model of the use of the enclosure Albersdorf-Dieksknöll. Grey: Absolute dating of the use phases. Black: Time between the re-cuttings. Sub-phases 4.1–4.2 are the Final Neolithic phases (phase 4.1: 2880–2640 BC; phase 4.2: 2580–2480 BC). A use in this period is a unique finding (DIBBERN 2016). Illustration: H. Dibbern

Most causewayed enclosures were abandoned during the late LN, indicating that old traditions became obsolete during this time (KLATT 2009, 65; LARSSON 2012, 120). However, the Albersdorf-Dieksknöll enclosure was not abandoned (Fig. 4). The intervals between the phases of use are set to ca. 100–200 years and reach into the 3rd millennium BC (DIBBERN 2016, 45–51). Consequently, in western SH, a certain tradition was maintained. The enclosure was an important place for the people during the LN and the FN. According to MÜLLER (2018, 15), the people maintained a collective memory. That complements the observation that the megaliths of the surrounding area were revisited as well (Fig. 1). Therefore, the FBC and SGC did not intentionally avoid each other. Summing up, this local perspective clearly shows that many changes took place during the late LN and not at the onset of the FN. Especially in the west of SH, there is a great amount of continuity. Experts from other regions (e.g. BECKERMANN 2015; IVERSEN 2015; KOLÁŘ 2020; DRUMMER 2022) also consider the LN–FN transformation as a phase of continuity, as I will explain further in the following sub-chapters. It is essential to take these regional studies into account when assessing the processes at the turn to the FN (cf. FURHOLT 2019, 125).

Regional burial perspective

Supposedly, the transition from the LN to the FN was a radical event, especially because of the alleged different burial traditions. In the FN, individual graves occur where individuals are directly associated with grave goods. In addition, specific gendered identities appear. Many researchers consider this novel burial practice as the beginning of individuality. In contrast, they do not reconstruct individual identities in LN collective tombs. Thus, they present the societies and/or ideologies of the LN and FN as antipodes of each other (DAMM 1991, 202; HÜBNER 2005, 694–719; FURHOLT 2012, 125; KRISTIANSEN *et al.* 2017).

However, single graves also occur in the YN (Younger Neolithic) and the LN in many regions (KOSSIAN 2005; MÜLLER 2019, 46). During the late LN, we find single graves in north-western Germany and especially in the Netherlands (FBC horizons Brindley 4–7; c. 3000–2800/2750 BC; cf. BRINDLEY 1986, 95–100). In northern and western Jutland, we find so-called cattle burials (or stone-heap graves) of the same date (horizons MN III–V; c. 3000–2800 BC; cf. IVERSEN 2015, 19–21). These burials probably represent single graves and they show parallels to Central and Eastern European contexts (JENSEN 2001, 400; JOHANNSEN – NIELSEN – JENSEN 2016, 42–48).

Those LN single burials consist of relatively standardised sets of grave gifts that reflect the respective local tradition of the megaliths (JENSEN 2001, 398–402; VAN DER VELDE – BOUMA – RAEMAEEKERS 2019, 319–323). However, some features are similar to later SGC traditions. The LN cattle burials and the earliest FN single graves in Jutland do not contain much pottery, but they combine battle-axes and flint axes (JENSEN 2001, 398–402; HÜBNER 2005, 640–647; FURHOLT 2014, 72). In the Netherlands, the grave architectures (stone and wooden cists, [rare] burial mounds and crouched positions) of the LN single graves are like those of the SGC (LANTING 2018, 108; VAN DER VELDE – BOUMA – RAEMAEEKERS 2019, 319–323). Both cases demonstrate that single burials and specific combinations of grave goods are not entirely new at the onset of the FN.

In addition to the LN single graves, we can also recognise indications for individual burials inside the collective graves. Generally, we must criticise the term collective grave. It obscures regional and temporal differences and the individual biographies of the burials. Unfortunately, the bone preservation in Northern Germany is too poor to make clear statements. However, a super-regional comparison shows major differences in collective burial traditions. In the gallery graves of Western Germany and the Paris Basin, up to several hundred individuals are buried in anatomically incorrect positions (rearranged secondarily). Moreover, primarily in the entrances or antechambers, apart from the individuals, only a few and often intentionally broken grave goods appear (SOHN 2002; PAPE 2019, 222–224; cf. Fig. 5). In other collective burials, the individuals possess more grave goods, directly in the chambers. Furthermore, the individuals are not manipulated secondarily. This is the case in the rock-cut tombs (*hypogea*) of the

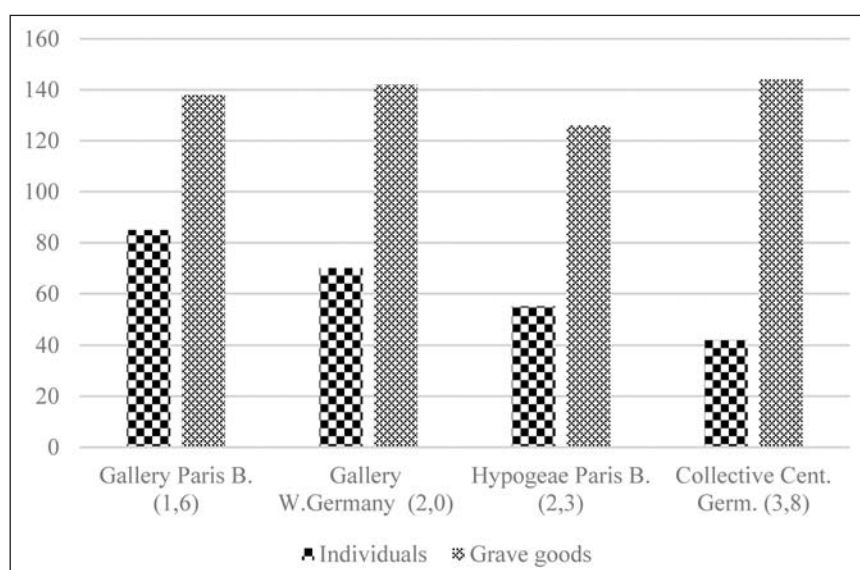


Fig. 5. The average number of individuals and grave gifts in different regions. The relation between individuals and grave finds is set in brackets (Data according to COTTIAUX et al. 2014 who obtained data from 53 chosen burials). Illustration: S. Schultrich

eastern Paris Basin. Here, too, gender-specific differences are already present in the LN (COTTIAUX *et al.* 2014, 515; BLIN 2015, 590–592).

In Central Germany, we find both graves with manipulated and non-manipulated individuals (MÜLLER 2001, 338; MIDGLEY 2007, 82–84). This, too, is indicated in Northern Germany and Southern Scandinavia, despite poor preservation (JENSEN 2001, 359–362; MISCHKA – FURHOLT 2019, 926). Generally, the frequency of grave goods is much higher in Central German collective burials than in gallery graves (*Fig. 5*). In addition, many grave goods of good quality appear in the chambers of Central and Northern Germany and Southern Scandinavia (COTTIAUX *et al.* 2014, 515). There is a clear difference between coarse settlement pottery and fine grave pottery in these regions (JENSEN 2001, 298–315; cf. IVERSEN 2015, 50–55; BROZIO 2016, 57–60, 146–149). In the gallery graves of the Paris Basin, in contrast, only coarse pottery was used as grave gifts infrequently (COTTIAUX *et al.* 2014, 459–464). The LN battle-axes also fit into the pattern of different body and grave gift treatment. They appear in gallery graves as broken pieces only, while in passage graves they mostly are complete, as I will explain further in the following sub-chapters.

In southern Germany, we just know a few LN burials (cf. e.g. MATUSCHIK *et al.* 2009). We must interpret this as an intentional burial custom that we cannot reconstruct archaeologically (FURHOLT 2009, 133). Here, the individuals were completely deconstructed after death. To sum up, this regional comparison shows that the term collective grave is ambiguous. The grave rituals appear to be very diverse (cf. VEIT 1993, 3–4; COTTIAUX *et al.* 2014, 515). Figuratively speaking, there is a scale ranging from more to less individualised burial rites and the different megalithic traditions tend to the one or the other end of the scale (*Fig. 6*). Maybe, the different burial customs mirror differences in the worldview of the societies. Either the deceased were deconstructed and entered a common sphere of ancestors, or they kept concrete individuals. In the latter case, they could refer to an idealistic identity (cf. VEIT 1993; ROBB – HARRIS 2018).

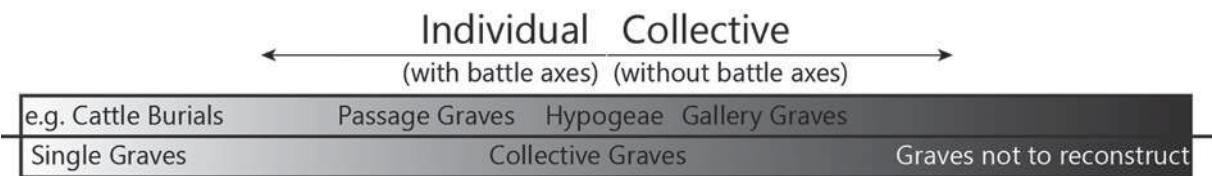


Fig. 6. A simplified scale to demonstrate the differences between the grave types. On the left are individual graves as one extreme and on the right is the Southern German lack of burials as the other extreme. In between are the different collective graves. Proper battle-axes occur in the middle and on the left side only. Illustration: S. Schultrich

Regional perspective on YN, LN and FN battle-axes

Battle-axes are key to understanding continuities in social behaviour during the Central European Neolithic. However, we have to leave old-established typochronological models. The main reference to YN and LN battle-axes to date is ZÁPOTOCKÝ’s study (1992). However, he did not include all known types of axes – lancet-shaped-axes (L-axes) lack as do French double-axes (*bipennes*). Furthermore, some of his chronological assumptions are not valid any longer. Especially his supposed dating of an axe type called KIVb turned out to be significantly wrong (see below). In addition, the duration of several other types has been adjusted since (MADSEN 1994, 328; SCHULTRICH 2022). Simplifying Zápotocký’s typology, we can distinguish hammer-axes and non-hammer-axes. The former consists of a hammer-like

butt end, either flat or round, and a distinctive cutting edge. They occur primarily in the YN in many regions and there are strong typological similarities (ZÁPOTOCKÝ 1992, 66–69).

During the LN, the regional variability increases. We find different types of non-hammer-axes: R-axes (*Fig. 7.10*) have round necks that are often shaped unintentionally. We find them frequently in Central Germany and the Czech Republic (ZÁPOTOCKÝ 1992, 107–110). Double-axes (D- und L-axes) are (almost) symmetrical axes with two cutting edges. In northern Germany, Denmark and Sweden, we find double-axes called D-axes (ZÁPOTOCKÝ 1992, 130–133; cf. IVERSEN 2015, 46; *Fig. 7.6*), while in Central and Southern Germany, Austria and Switzerland L-axes occur (MAIER 1964, 120–124; BERAN 1990, 8–12; KÖNINGER 2012, 33–35; *Fig. 7.8–9*). In France, *bipennes* appear (e.g. GACHINA – GOMEZ

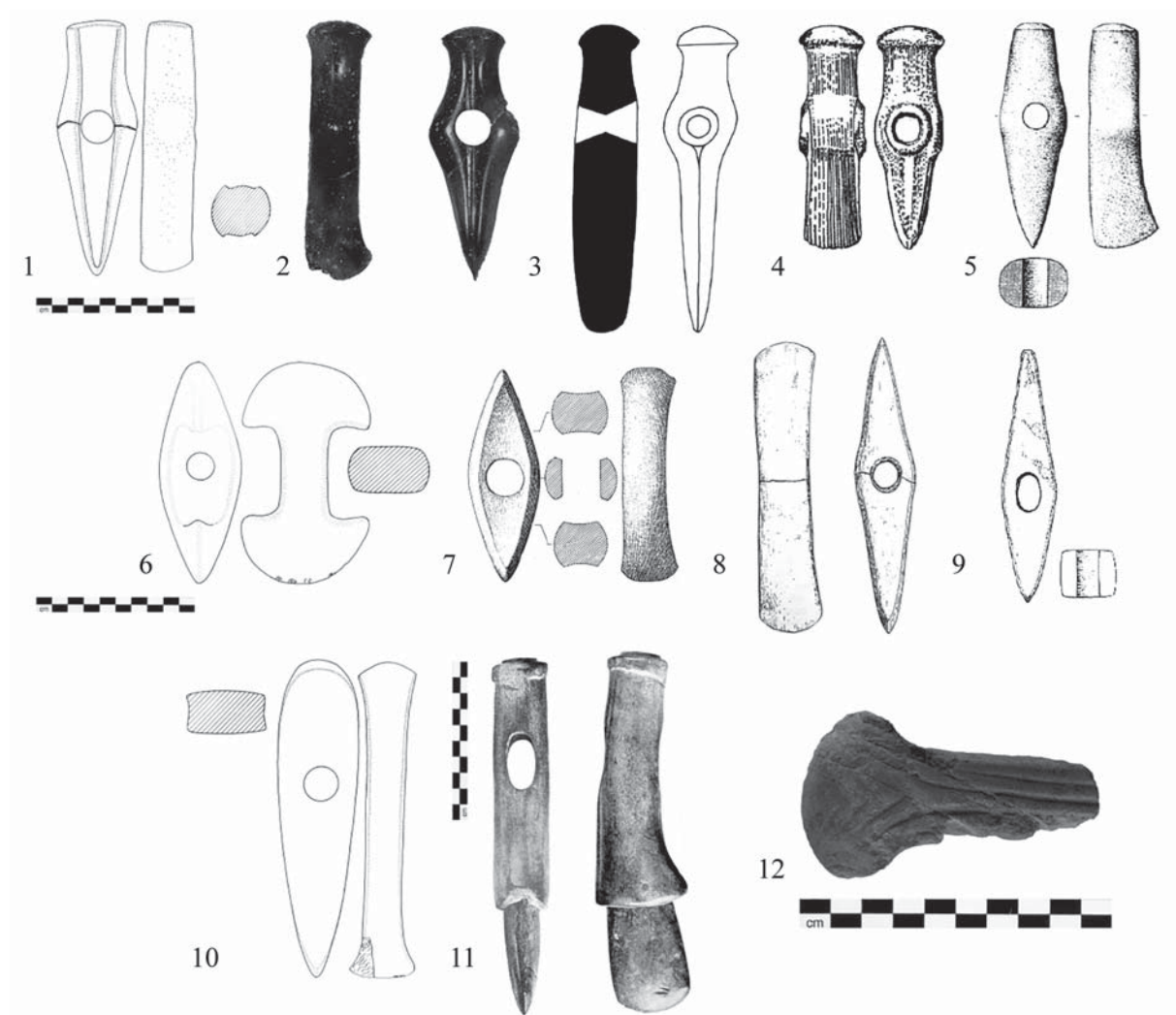


Fig. 7. Various battle-axes from the YN, the LN and the FN. Top row: Hammer axes (1. YN FI-axe, Heringsdorf, Northern Germany, 2. YN KIV-axe, Weiach, Switzerland, 3. LN Knob-butted axe, Senigallia, Italy, 4. LN KIVb-axe, Netherlands, 5. FN A-axe, Großflintbek, Northern Germany). Central row: Double axes (6. LN DII-axe, Melzow, Eastern Germany, 7. LN Bipenne, Pierrefitte-sur-Sauldre, Centre-Val de Loire, France, 8. LN L-axe, Lüscherz, Switzerland, 9. LN L-axe, Konstanz, Southwestern Germany). Lower row: Round butt axes and an antler battle-axe (10. LN RIV-axe, Bruchwedel, Northern Germany, 11. LN antler axe, Kattendijkdok, Belgium, 12. Fragment of LN RV-axe from a gallery grave in Schmerlecke, Western Germany). (For the references of the respective specimens, cf. SCHULTRICH 2022). Illustration: S. Schultrich

– COFFYN 1975; GIOT – L’HELGOUACH – MONNIER 1979; SCHULTRICH 2022; *Fig. 7.7*). R-axes and the various double-axes are mixed typologically (ZÁPOTOCKÝ 1992, 120). In the FN, we again meet certain hammer-axes. Especially so-called A-axes appear super-regionally (STRUVE 1955; BUCHVALDEK 1986; *Fig. 7.5*). However, typical, ‘pan-European’ A-axes are not the earliest CWC axes as supposed in earlier studies (HÜBNER 2005, 143–146). The different shape of the FN A-axes and the LN specimens is often used as a supporting argument that a cultural break occurred with the emergence of the CWC (e.g. ZÁPOTOCKÝ 1992, 2). Moreover, the rapid replacement of the LN R-, D- and L-axes at the turn to the FN supports this. Furthermore, many researchers highlight the widespread distribution of the allegedly homogenous A-axes. This, in turn, supposedly points to a common origin of the axes and the CWC in general (BUCHVALDEK 1986; FURHOLT 2014).

However, YN hammer-axes appear widespread in Central and Eastern Europe as well. LN axes are also widespread and they, too, appear abruptly. They replace the YN hammer-axes in Central Europe in the middle of the 4th millennium BC (ZÁPOTOCKÝ 1992, 198–200). Thus, wide distributed axes, and rapid adaptations of new shapes, are not exclusive features of the emerging CWC. We observe this pattern repeatedly. Accordingly, there was a supra-regional consensus regarding the battle-axe idea from the YN to the FN (cf. KLIMSCHA 2016, 86). This temporal broader perspective limits the assumed innovation of the A-axes and thus, the CWC. Furthermore, the alleged novelty of integrating axes into individual graves must also be considered in perspective.

Regional perspective on battle-axes in burials

During the YN, battle-axes rarely occur in graves. This change during the LN in northern Central Europe (*Fig. 8*). As seen already, regional differences in the treatment of the bodies and the number, position and state of the grave goods appear. Battle-axes follow this pattern. Generally, in Western Germany, LN battle-axes are rare. Just a few stray and grave finds appear (*Fig. 9*). In some gallery graves, fragments of battle-axes or mundane ‘working shaft-hole axes’ occur, but we do not know proper and unbroken examples (RINNE 2003, 58, 104; cf. *Fig. 7.12*). In the Paris Basin, lithic battle-axes are rare and never appear in burials (SCHULTRICH 2022). On the other hand, antler axes³ occur (*Fig. 7.11*). These axes are found significantly more frequently in *hypogea* than in gallery graves (SOHN 2002, 510; cf. BLIN 2015). Thus, the number of axes correlates with the overall higher number of grave gifts and a different treatment of the dead.

In southern Germany, Austria and Switzerland, the deposition of L-axes follows ancient patterns (MAIER 1964, 120–124), and accordingly, the axes were not integrated into burials. However, this might also be related to the overall lack of LN burials (cf. FURHOLT 2009, 133). In contrast, we find numerous LN battle-axes in the collective graves (*Fig. 9*). Furthermore, predominantly they appear not to be fragmented, despite local differences (ZÁPOTOCKÝ 1992, 164–166). Mundane shaft-hole axes, however, are missing in burials contexts (ZÁPOTOCKÝ 1992; IVERSEN 2015, 46–47). Thus, there is a correlation between grave goods of high quality and the number and the state of battle-axes. In northern Central Europe, 10–20 % (peak σ 22 %) of all battle-axes were deposited in burial contexts during the LN. That does not appear much, but FN battle-axes do not reach the same proportions (*Fig. 8*: 28th century).

³ These peculiar artefacts are composed of an antler shaft and a flint axe. Due to their shaft-hole, they were handled just as battle-axes of stone. Rare depictions of these axes in some *hypogea* prove this (CHARPY 2014, 413–416). In the *hypogea*, a spatial gender division appears. The females were predominantly buried on the right and the males on the left side of the chamber. Interestingly, the antler axes appear in the female area (BLIN 2015, 590–592). That contests the general idea that tools and weapon-like artefacts belonged exclusively to males during the Neolithic.

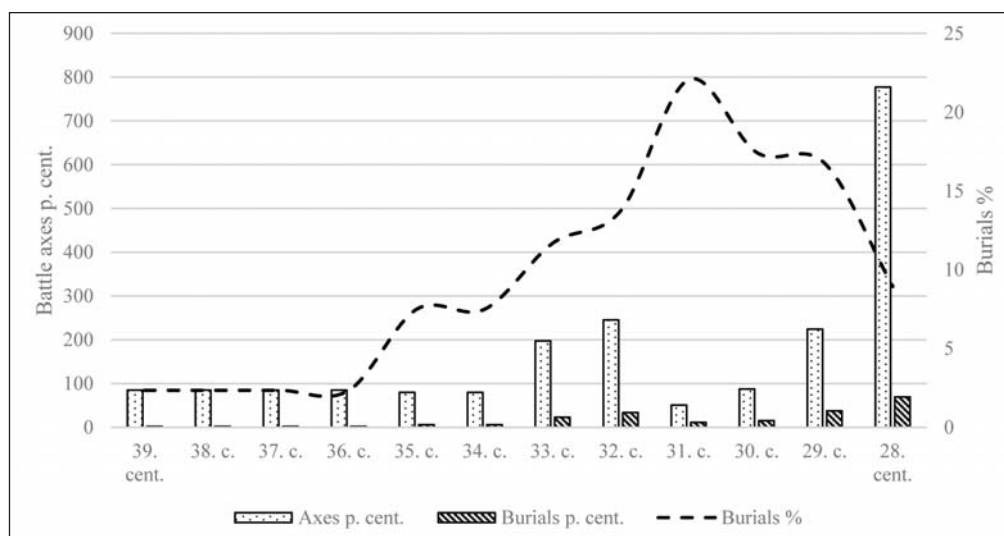


Fig. 8. The consumption of Younger (39th–34th century BC), Late (33th–29th century BC) and early Final Neolithic (28th century BC) battle-axes per year. The dotted line shows the percentage of battle-axes that come from burial contexts. Illustrated are data from Northern Germany and Denmark, but the last time slice (28th century BC) is without Denmark as too many finds have been made there in this period which would exceed the scale (SCHULTRICH 2022). Illustration: S. Schultrich

Accordingly, the decisive break in the tradition of using battle-axes as grave goods took place in the early LN and not at the threshold of the FN with the emergence of the CWC. Thus, this specific deposition pattern was handed down from the LN to the FN.

Repeated patterns and an alternative approach for the emergence of CWC A-axes

The emergence of FN hammer-axes is associated with a significant increase in absolute numbers (Fig. 8). Another new element in large parts of Central Europe is the individual burial customs that can integrate battle-axes (e.g. HEYD 2000; HÜBNER 2005). From this perspective, massive changes appear with the onset of the CWC in Southern Germany, where LN burials are lacking. The new shape of the FN A-axe made old traditions obsolete and this made it possible for a larger part of society to participate in certain social ideals.

In northern Central Europe, we detect a significant increase in the number of burial contexts with battle-axes also during the LN (Fig. 8). Accordingly, we face a particular phenomenon twice: with new shapes of battle-axes, new burial practices emerge. The basic concepts of hammer-axes and LN non-hammer-axes axes differ. Maybe, each axe form had its narrative. The LN axes did not any longer stick to the old narrative of YN hammer-axes and the FN hammer-axes did not stick to the narrative of LN axes.

We see the emergence and evolution of YN, LN and FN battle-axe shapes on a supra-regional scale. For example, the concept of the LN double-axes was accepted in northern Central Europe, Southern Germany and France (Fig. 9). Accordingly, there was a superregional understanding of basic morphological principles in a large area. Maybe, there even was a basic consensus concerning (parts of) the narrative of the battle-axe. This might explain the abrupt and rapid adoption of the FN A-axes. It rests on the LN network of shared narratives.

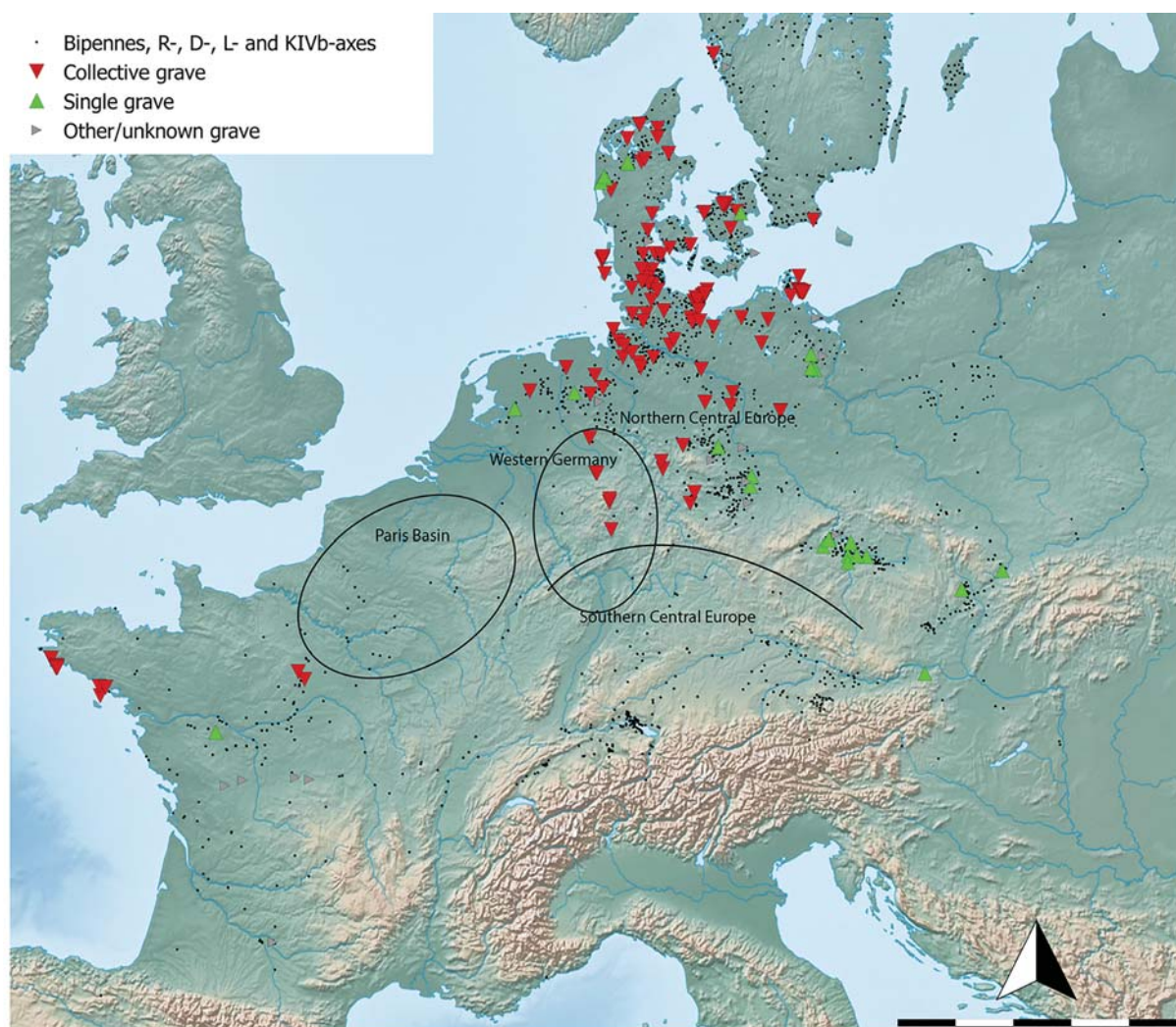


Fig. 9. The distribution of single finds (black dots) and grave finds of LN battle-axes (SCHULTRICH 2022).
Illustration: S. Schultrich

In the research on the CWC, the notion is prevalent that all CWC attributes possess distinct places of origin (cf. STRUVE 1955; BUCHVALDEK 1986). For example, FURHOLT (2014, 72–74; 2019) is not looking for the emergence of A-axes in Eastern Central Europe any longer but proposes Jutland as the region of origin. Nevertheless, still, he assumes that CWC attributes were distributed structurally. With the knowledge of the YN and LN battle-axe networks, we can propose an alternative explanation. Namely, for A-axes, no specific place of origin is present. It evolved in the network. This idea contests the prevalent notion. It also explains the regional and local differences in the shapes that were present from the very beginning of CWC axes.⁴ The main idea of the hammer-axe is identical in all regions, but its definite shape and context were negotiated locally (cf. RIBEIRO 2018, 113–115).

⁴ E.g. in Jutland, highly elaborate hammer-axes (A2, A3, different B-, C- and D-axes) occur before the classical, ‘pan-European’ A-axe (HÜBNER 2005, 143–146). The classic A-axe is spread super-regionally and was part of the so-called A-horizon. Originally, this horizon marked the beginning of the CWC in many regions (BUCHVALDEK 1986). However, in the meanwhile this horizon was deconstructed (FURHOLT 2014, 72–73).

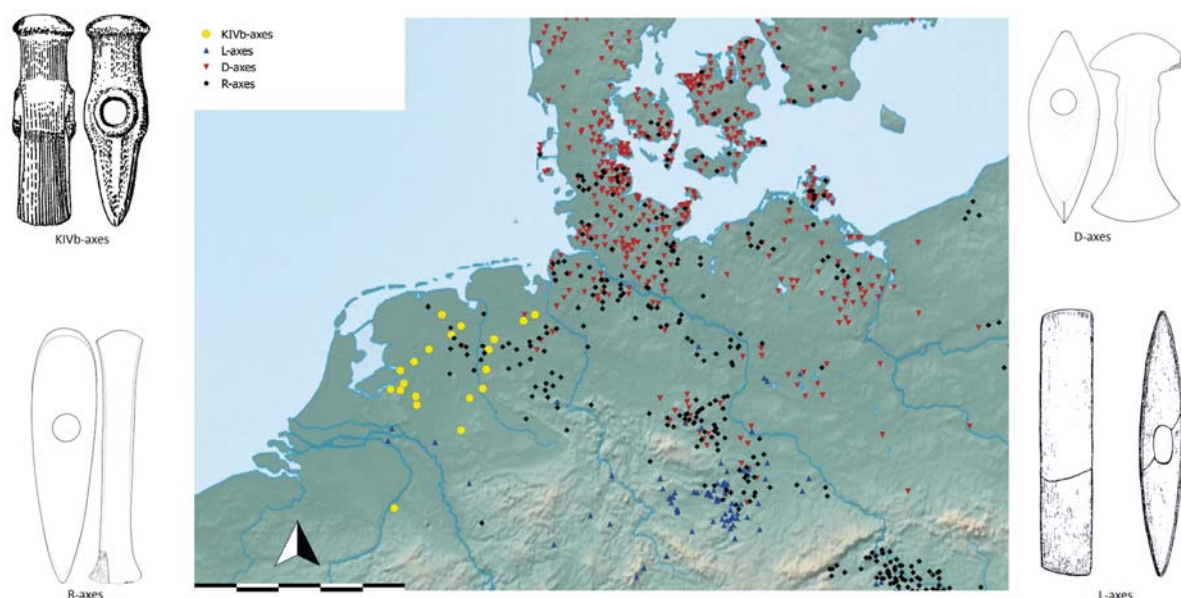


Fig. 10. Distribution of battle-axes of the late 4th and the early 3rd millennium BC. Note the mutual exclusion of hammer axes (KIVb) and double axes (D). Axes without scale. (Data according to BERAN 1990; ZÁPOTOCKÝ 1992; LANTING 2018). Illustration: S. Schultrich

Here, I present an alternative approach to the origin of the FN A-axes. The YN and FN battle-axes follow the same morphological principle: they are hammer-axes. To put them in a direct connection does not seem adequate because of the hiatus between them, which according to ZÁPOTOCKÝ's (1992) dating, spans 700 years (3500–2800 BC). However, MADSEN (1994) has already shown that K-axes in southern Scandinavia appear at least until 3300 BC. Furthermore, various K-axes appear during the LN in parts of Eastern Europe and the Caucasus (e.g. HANSEN 2010, 303–304), in Northern and Central Italy (SKEATES 1992, 397; JEUNESSE 2017, 171–175; *Fig. 7.3*) and in the Netherlands and Northwestern Germany K-axes occur until the threshold of the CWC (LANTING 2018, 114–115). The latter region deserves special mention. Here, LN R-axes are seldom and D-axes are completely missing, while KIVb-axes (according to ZÁPOTOCKÝ's [1992] terminology) occur (*Fig. 7.4; Fig. 10*). That is the opposite situation in Central Europe, where double-axes occur but hammer-axes are missing during the LN. Thus, in all regions, the different axe concepts apparently could not coexist. They seem to have been mutually exclusive. That is a further argument for the idea that each axe form had its narrative.

Possibly, the existence of LN hammer axes enabled their adoption with the onset of the CWC. Here, hammer-axes quickly advanced to the predominant symbol. As the concepts seem to be mutually exclusive, the renaissance of the hammer-axe makes the LN shapes obsolete. With the new shape, or rather the very old one, a new narrative emerged and the absolute number of battle-axes rose drastically. Perhaps, the idealistic identity that is attached to the battle-axe became accessible to larger parts of the population.

The war-like identity during the LN

In Southern and Eastern Europe, individual burials and war-like artefacts occur in the 4th millennium BC (e.g. HANSEN 2014; HEYD 2016; JEUNESSE 2017).⁵ Certain social identities are associated with this. These identities are idealistic as the set of grave goods is stereotypic and they involve the representation of certain identities (often gendered) in rock art (ROBB – HARRIS 2018, 140–142). In Spain, Southern France and Italy, daggers and halberds are important war-like symbols. They were deposited predominantly as single finds and regularly in funerary contexts. They consist of stone, copper and antler. Moreover, they were engraved on rocks and stelae (HORN 2014, 76–84; STEININGER 2015, 45–47; JEUNESSE 2017, 172–177). This multifaceted presentation confirms the high symbolic significance of halberds and daggers during the LN in Southern Europe.

For Central Europe, most scholars agree that idealistic and gendered identities emerged with the onset of the FN CWC (e.g. HARRISON – HEYD 2007; JEUNESSE 2017). However, all these characteristics, that indicate idealistic identities in Southern and Eastern Europe, are also present in Central Europe during the LN. Here, LN battle-axes were deposited in graves regularly (*Fig. 8*). Battle-axes consist of stone, antler (cf. DE CAPITANI *et al.* 2002; COTTIAUX *et al.* 2014, 506–509) and copper.⁶ Although rarely, they were engraved in burial chambers and on stelae (HANSEN 2010, 304; CHARPY 2014, 413–416). Just as daggers and halberds were the primary war-like artefact in Southern Europe during the LN, battle-axes fulfilled this function in Central Europe. Accordingly, in Central Europe, similar social ideals may have existed as in Southern (and Eastern) Europe during the late 4th millennium BC. The assumption that collective graves represent a society without individuals obscures the significance. Accordingly, the emergence of the CWC is not to be associated with an ideological reorientation. This process already took place beforehand. With the CWC certain ideals became more evident, as single graves and battle-axes became much more common. However, people did not invent such ideals at the onset of the FN.

Remarks on the genetic evidence

We see that there are continuities in LN and FN social and ritual behaviour. However, we also know that the individuals of the 3rd millennium BC in Central Europe have a new ancestry. Due to bad bone preservations, we do not know exactly the situation in the study area. However, we should expect the new ancestry here as well. The question arises of how to combine the genetic and archaeological evidence into one model for Northern Germany. In former studies on aDNA (e.g. HAAK *et al.* 2015) the resolution of data was low. It covered a huge territory and a long period. This provided a target for criticism (HEYD 2017; FURHOLT 2019). The recent study of PAPAC *et al.* (2021), by contrast, has a high-resolution dataset on individuals from the Czech Republic. Here we see that R1a-haplotypes quickly predominate. Also, we see that the LN individuals never possess this ancestry (PAPAC *et al.* 2021, 5).

However, there are three important findings in the recent study by PAPAC *et al.* (2021) which limit drastic interpretations. Firstly, the earliest CWC burials were not associated with R1a exclusively. This is true for individuals of the early CWC Złota group as well who are genetically identical to Globular

⁵ Once again, we have to be cautious to avoid general statements. For example, many authors consider the burials of the Yamnaya culture to be war-like. However, there is hardly any evidence for this (KAISER 2019, 93).

⁶ According to the study of KIBBERT (1980), so-called Zabitz-type axes (double-axes) date to the late FN and the EBA. However, now it is confirmed that they (also) date to the LN. Among other things, clear morphological analogies to L-axes of the Alpine region speak for this dating (general shape, oval shaft-holes, but also deposition in wetlands) (BUNNEFELD 2019, 191; SCHULTRICH 2022). Moreover, in Northwestern Germany, knob-butt copper axes occur during the LN (SCHULTRICH 2022).

Amphorae (GAC) individuals (SCHROEDER *et al.* 2019, Fig. 2). Secondly, the spread of the ancestry was not male-dominated at the beginning. Thirdly, the dominance of the steppe ancestry is the result of a long process.

We observe a reduction in Y-chromosome variability since the end of the Palaeolithic (ZENG – AW – FELDMAN 2018). Moreover, the rivalry also affects R1a. At the beginning of the FN, there are five R1a lineages, in the end, there is only one left (PAPAC *et al.* 2021, 6). PAPAC *et al.* (2021) calculate that an ongoing rate of about 15 % more descendants of one lineage is sufficient to cause the observations. Accordingly, we see a continuous process of rivalling male lineages that is not exclusively related to the steppe ancestry. Furthermore, the individuals may not have perceived this benefit by themselves (cf. BURMEISTER – MÜLLER-SCHESSEL 2006, 9). We have to leave the notion of two blocks, the pre-steppe and steppe ancestry, as opposing each other. Whatever happened, we only gain a glimpse of the complex processes.

Discussion

We do not know, whether R1a-haplotypes were present in the study area from the onset of the FN. When we seek to combine the genetic and archaeological evidence into one model for the study area, we have to be aware of the complex situation in other regions: some regions fit the model of massive (or less massive) migrations while some do not. In the Dutch CWC, subsistence strategies and pottery production continue local LN traditions. The (massive) migration model did not turn out to be adequate (BECKERMANN 2015, 184–195). Similarly, there appear to be significant differences between western and eastern Swiss CWC. In the west, battle-axes appear in settlement contexts, single burials are almost lacking, pots in CW style just make up 10 % of all pottery, and the cords for the typical decoration even were wound oppositely (WOLF 1992, 195; GILIGNY – MICHEL 1995, 357). In the Czech Republic, communication and exchange systems remained stable (KOLÁŘ 2020, 1180). In the German low mountain range, crucial transformations took place in c. 3000 BC and the CWC was fully established in 2600 BC. Pottery traditions and rock art developed continuously without a break (DRUMMER 2022, 225). On the Danish Islands, aDNA evidence is almost lacking that either proves or disproves the migration models (IVERSEN 2015). However, a model of continuing interaction instead of a quick replacement is widely accepted (IVERSEN 2015; EGFJORD *et al.* 2021, 11).

With these five examples, it is clear that one single model is not adequate for all regions, especially in those far away from CWC core areas. As long as we do not have clear evidence, we cannot just take the evidence of one region and put it on the other. In the study area, many continuities appear during the transition from the LN to the FN. This is particularly clear in SH, where landscape use remains stable, and megaliths and the enclosure were used continuously. Furthermore, the regional perspective shows that a decisive change in using battle-axes as grave gifts, already began in the LN. Presumably, a war-like identity was already present during the LN in many regions. The cultural continuities suggest a continuous influx of new people and ideas into Northern Germany, but no one-time massive migration. That is similar to the Danish Island. We should consider several migrations in loose networks and high individual mobility (FURHOLT 2019; 2021; DRUMMER 2022, 220).

Conclusions

To explain the super-regional CWC homogeneity, FURHOLT (2017) comes up with the concept of trans-locality. The more homogeneous the material culture appears in a given space, the more people had

contact with each other (FURHOLT 2017, 115). For example, KOLÁŘ (2020, 1181) adopted this concept to explain the novelties and continuities in his research area. Intensive communication already took place on a pan-European level in the 4th millennium BC. The communication is shown, among other things, by the spread of the GAC as well as the symbolism connected to cattle and chariots (JOHANNSEN *et al.* 2016, 48; KLIMSCHA 2016, 86–91; KAISER 2019, 94; cf. HEYD 2017). Battle-axes and the attached war-like identities testify to these supra-regional networks as well. Accordingly, the societies were organised trans-locally during the LN already. Within these networks, ideas and people moved.

Using the same “language” (i.e. similar battle-axes) during the LN potentially triggered the mobility of people between local groups. On this basis, new ancestry could spread quickly – completely without massive migrations, violent conquests, the spread of illnesses or a passive role of females. The genetic turnover did not happen as quickly as proposed by earlier studies. “*The speed and massiveness might be overexaggerated*” (FURHOLT 2021, 33). Neither the CWC itself nor the ancestry initiated the process. The examples of SCHROEDER *et al.* (2019), PAPAC *et al.* (2021), even show that CWC burial rites can occur independently from R1-genes. Accordingly, we must not evaluate the moment of the established change alone, but rather, we should investigate the time leading up to the changes. The super-regional networks and identities of the LN provided the framework for the rapid expansion of new ancestry and CWC symbols during the FN.

References

- BECKERMANN, S. M. 2015
Corded Ware Coastal Communities. Using Ceramic Analysis to reconstruct Third Millennium BC Societies in the Netherlands. Leiden 2015.
- BERAN, J. 1990
 Lanzettförmige Doppeläxte des jüngeren Mittelneolithikums im Saalegebiet. *Alt-Thüringen* 25 (1990) 7–29.
- BLIN, A. 2015
 Mortuary Practices as Evidence of Social Organization in the Neolithic Hypogea of the Paris Basin. *European Journal of Archaeology* 18/4 (2015) 580–598.
- BRINDLEY, A. L. 1986
 The typochronology of TRB West Group pottery. *Palaeohistoria* 28 (1986) 93–132.
- BROZIO, J. P. 2016
Megalithanlagen und Siedlungen im Trichterbecherzeitlichen Ostholstein. Frühe Monumentalität und soziale Differenzierung 9. Bonn 2016.
- BUCHVALDEK, M. 1986
 Zum gemeineuropäischen Horizont der Schnurkeramik. *Prähistorische Zeitschrift* 61 (1986) 129–151.
- BUNNEFELD, J. H. 2019
 Werkzeuge, Waffen oder Insignien? – Zu den sogenannten gerippten „Doppeläxten“ der Aunjetitzer Kultur. In: Meller, H. – Bertemes, F. (eds.): *Der Aufbruch zu neuen Horizonten. Neue Sichtweise zur europäischen Frühbronzezeit.* Halle (Saale) 2019, 183–203.

BURMEISTER, S. – MÜLLER-SCHEESSEL, N. 2006

Einführung: Die Identifizierung sozialer Gruppen. Die Erkenntnismöglichkeiten der Prähistorischen Archäologie auf dem Prüfstand. In: Burmeister, S. – Müller-Scheeßel, N. (eds.): *Soziale Gruppen – kulturelle Grenzen: die Interpretation sozialer Identitäten in der prähistorischen Archäologie*. Münster 2006, 9–38.

DE CAPITANI, A. – DESCHLER-ERB, S. – LEUZINGER, U. – MARTI-GRÄDEL, E. – SCHIBLER, J. 2002

Die jungsteinzeitliche Seeufersiedlung Arbon-Bleiche 3. Funde. Thurgau 2002.

CHARPY, J.-J. 2014

Nouvelle lecture des sculptures trouvées dans les hypogées des Marais de-Saint-Gond (Marne). In: Cottiaux, R. – Salanova, L. (eds.): *La fin du IV^e millénaire dans le Bassin Parisien: Le Néolithique récent entre Seine, Oise et Marne (3500-2900 avant notre ère)*. Dijon 2014, 411–422.

COTTIAUX, R. – SALANOVA, L. – BRUNET, P. – HAMON, T. – LANGRY-FRANÇOIS, F. – MAINGAUD, R. et al. 2014

Néolithique récent dans le Bassin parisien (3600-2900 avant notre ère): périodisation et faciès régionaux. In: Cottiaux, R. – Salanova, L. (eds.): *La fin du IV^e millénaire dans le Bassin Parisien: Le Néolithique récent entre Seine, Oise et Marne (3500–2900 avant notre ère)*. Dijon 2014, 455–529.

DAMM, C. 1991

The Danish Single Grave Culture – Ethnic Migration or Social Construction? *Journal of Danish Archaeology* 10 (1991) 199–205.

DIBBERN, H. 2016

Das trichterbecherzeitliche Westholstein: Eine Studie zur neolithischen Entwicklung von Landschaft und Gesellschaft. Frühe Monumentalität und soziale Differenzierung 8. Bonn 2016.

DRUMMER, C. 2022

Vom Kollektiv zum Individuum. Transformationsprozesse am Übergang vom 4. Zum 3. Jahrtausend v. Chr. in der deutschen Mittelgebirgszone. Scales of Transformations in Prehistoric and Archaic Societies vol. 13. Leiden 2022.

EGFJORD, A. F.-H. – MARGARYAN, A. – FISCHER, A. – FISCHER, K.-G. – PRICE, T. D. – JOHANNSEN, N. N. et al. 2021

Genomic Steppe ancestry in skeletons from the Neolithic Single Grave Culture in Denmark. *PLoS ONE* 16/1 (2021) e0244872. <https://doi.org/10.1371/journal.pone.0244872>.

EBBESSEN, K. 2006

The battle axe Periode – Stridsøksetid. Copenhagen 2006.

FEESER, I. – DÖRFLER, W. – AVERDIECK, F. R. – WIETHOLD, J. 2012

New insight into regional and local land-use and vegetation patterns in eastern Schleswig-Holstein during the Neolithic. In: Müller, J. – Hinz, M. (eds.): *Siedlung, Grabenwerk, Großsteingrab. Studien zu Gesellschaft, Wirtschaft und Umwelt der Trichterbechergruppe im nördlichen Mitteleuropa*. Frühe Monumentalität und soziale Differenzierung 2. Bonn 2012, 159–190.

FEESER, I. – DÖRFLER, W. 2016

Landschaftsentwicklung und Landnutzung. In: Dibbern, H. (ed.): *Das trichterbecherzeitliche Westholstein: Eine Studie zur neolithischen Entwicklung von Landschaft und Gesellschaft*. Frühe Monumentalität und soziale Differenzierung 8. Bonn 2016, 17–24.

FURHOLT, M. 2009

Die nördlichen Badener Keramikstile im Kontext des mitteleuropäischen Spätneolithikums (3650–2900 v. Chr.). Studien zur Archäologie in Ostmitteleuropa Band 3. Bonn 2009.

FURHOLT, M. 2012

Monuments and Durable Landscapes in the Neolithic of Southern Scandinavia and Northern Central Europe. In: Furholt, M. – Hinz, M. – Mischka, D. (eds.): *“As time goes by?” Monumentality, Landscapes and the Temporal Perspective. Proceedings of the International Workshop “Socio-Environmental Dynamics over the Last 12.000 Years: The Creation of Landscapes II in Kiel”*. Bonn 2012, 115–132.

FURHOLT, M. 2014

Upending a “Totality”: Re-evaluating Corded Ware Variability in Late Neolithic Europe. *Proceedings of the Prehistoric Society* 80 (2014) 67–86.

FURHOLT, M. 2017

Socio-spatial organisation and early Neolithic expansion in Western Anatolia and Greece. In: Gori, M. – Ivanova, M. (eds.): *Balkan Dialogues. Negotiating Identity between Prehistory and the Present*. Abdingdon 2017, 111–130.

FURHOLT, M. 2019

Re-integrating Archaeology: A Contribution to aDNA Studies and the Migration Discourse on the 3rd Millennium BC in Europe. *Proceedings of the Prehistoric Society* 85 (2019) 115–129.

FURHOLT, M. 2021

Mobility and Social Change: Understanding the European Neolithic Period after the Archaeogenetic Revolution. *Journal of Archaeological Research* 29 (2021) 481–535.

GACHINA, J. – GOMEZ, J. – COFFYN, A. 1975

Supplément à l’inventaire des instruments perforés pour les départements de Charente, Charente-Maritime et Gironne. *Bulletin de la Société préhistorique Française* 72 (1975) 368–381.

GILIGNY, F. – MICHEL, S. 1995

L’Évolution des céramiques de 2920 à 2440 av. J.-C. dans la région des trois lacs (Suisse Occidentale). In: Voruz, J.-L. (ed.): *Chronologies néolithiques. De 6000 à 2000 avant notre ère dans le Bassin rhodanien*. Préhistorique Rhodanienne 1995, 347–361.

GIMBUTAS, M. 1976

The Three Waves of the Kurgan People into Old Europe, 4500–2500 B.C. In: Robbins Dexter, M. – Jones-Bley, K. (eds.): *M. Gimbutas, The Kurgan Culture and the Indo-Europeanization of Europe. Selected articles from 1952 to 1993*. Journal of Indo-European Studies Monograph 18. Washington D. C. 1997, 240–266.

GIOT, P.-R. – L’HELGOUACH, J. – MONNIER, J.-L. 1979

Préhistoire de la Bretagne. Rennes 1979.

GLOB, P. V. 1944

Studier over den jyske Enkeltgravskultur. Copenhagen 1944.

HAAK, W. – LAZARIDIS, I. – PATTERSON, N. – ROHLAND, N. – MALLICK, S. – LLAMAS, B. et al. 2015

Massive migration from the steppe was a source for Indo-European languages in Europe. *Nature* 522/7555 (2015) 207–211.

HAGE, F. 2016

Büdelstorf-Borgstedt. Eine trichterbecherzeitliche Kleinregion. Frühe Monumentalität und soziale Differenzierung 11. Bonn 2016.

HANSEN, S. 2010

Communication and exchange between the Northern Caucasus and Central Europe in the fourth millennium BC. In: Hansen, S. – Hauptmann, A. – Motzenbäcker, I. – Pernicka, E. (eds.): *Von Majkop bis Trialeti. Gewinnung und Verbreitung von Metallen und Obsidian in Kaukasien im 4.-2. Jt. v. Chr.* Kolloquien zur Vor- und Frühgeschichte 13. Bonn 2010, 297–316.

HANSEN, S. 2014.

Der Held in historischer Perspektive. In: Link, T. – Peter-Röcher, H. (eds.): *Gewalt und Gesellschaft. Dimensionen der Gewalt in ur- und frühgeschichtlicher Zeit.* Bonn 2014, 159–168.

HARRISON, R. J. – HEYD, V. 2007

The Transformation of Europe in the Third Millennium BC: The Example of ‘Le Petit Chasseur I+III (Sion, Valais, Switzerland). *Praehistorische Zeitschrift* 82/2 (2007) 129–214.

HECHT, D. 2007

Das schnurkeramische Siedlungswesen im südlichen Mitteleuropa. Eine Studie zu einer vernachlässigten Fundgattung im Übergang vom Neolithikum zur Bronzezeit. Heidelberg 2007.

HEYD, V. 2000

Die Spätkupferzeit in Süddeutschland: Untersuchungen zur Chronologie von der ausgehenden Mittelkupferzeit bis zum Beginn der Frühbronzezeit im süddeutschen Donaueinzugsgebiet und den benachbarten Regionen bei besonderer Berücksichtigung der keramischen Funde. Saarbrücker Beiträge zur Altertumskunde Band 73. Bonn 2000.

HEYD, V. 2016

Das Zeitalter der Ideologien: Migration, Interaktion, und Expansion im prähistorischen Europa des 4. und 3. Jahrtausends v. Chr. In: Furholt, M. – Grossmann, R. – Szmyt, M. (eds.): *Transitional Landscapes? The 3rd Millennium BC in Europe.* Bonn 2016, 53–84.

HEYD, V. 2017

Kossinna’s smile. *Antiquity* 91/356 (2017) 348–359.

HEYD, V. 2021

Yamnaya, Corded Wares, and Bell Beakers on the Move. In: Heyd, V. – Kulcsár, G. – Preda-Bălănică, B. (eds.): *Yamnaya Interactions. Proceedings of the International Workshop held in Helsinki, 25-26 April 2019.* The Yamnaya Impact of Prehistoric Europe 2. Budapest 2021, 383–414.

HORN, C. 2014

Studien zu den europäischen Stabdolchen. Bonn 2014.

HÜBNER, E. 2005

Jungneolithische Gräber auf der Jütischen Halbinsel. Typologische und chronologische Studien zur Einzelgrabkultur. Nordiske Fortidsminder Serie B 24:1. Copenhagen 2005.

IMMEL, A. – PIERINI, F. – RINNE, C. – MEADOWS, J. – BARQUERA, R. – SZOLEK, A. et al. 2021

Genome-wide study of a Neolithic Wartberg grave community reveals distinct HLA variation and hunter-gatherer ancestry. *Communications Biology* 4/113 (2021). doi: 10.1038/s42003-020-01627-4.

IVERSEN, R. 2015

The Transformation of Neolithic Societies. An Eastern Danish Perspective on the 3rd Millennium BC. Aarhus 2015.

JENSEN, J. 2001

Danmarks Oldtid. Stenalder 13.000–2.000 f. Kr. Copenhagen 2001.

JEUNESSE, C. 2017

Emergence of the Ideology of the Warrior in the Western Mediterranean during the second Half of the fourth Millennium BC. *Eurasia Antiqua* 14 (2017) 171–184.

JOHANNSEN, N. N. – NIELSEN, S. K. – JENSEN, S. T. 2016

Northwestern Jutland at the Dawn of the 3rd Millennium: Navigating Life and Death in a New Socioeconomic Landscape? In: Furholt, M. – Grossmann, R. – Szmyt, M. (eds.): *Transitional Landscapes? The 3rd Millennium BC in Europe*. Bonn 2016, 35–52.

KAISER, E. 2019

Das dritte Jahrtausend im osteuropäischen Steppenraum. Kulturhistorische Studien zu Prähistorischer Subsistenzwirtschaft und Interaktion mit benachbarten Räumen. Berlin Studies of the Ancient World 37. Berlin 2019.

KIBBERT, K. 1980

Die Äxte und Beile im mittleren Westdeutschland I. Prähistorische Bronzefunde, Abteilung IX, Band 10. München 1980.

KLASSEN, L. 2008

Zur Bedeutung von Getreide in der Einzelgrabkultur Jütlands. In: Dörfler, W. – Müller, J. (eds.): *Umwelt – Wirtschaft – Siedlungen im dritten vorchristlichen Jahrtausend Mitteleuropas und Südkandinaviens.* Neumünster 2008, 49–66.

KLATT, S. 2009

Die neolithischen Einhegungen im westlichen Ostseeraum. Forschungsstand und Forschungsperspektiven. In: Biermann, F. – Terberg, T. (eds.): *Neue Forschungen zum Neolithikum im Ostseeraum. Archäologie und Geschichte im Ostseeraum* 5. Rahden/Westfalen 2009, 7–134.

KLIMSCHA, F. 2016

Axes and Allies: Long-range Contacts in Northern Central Europe during the 4th and 3rd Millennia BC as Exemplified by Stone and Metal Artefacts. In: Furholt, M. – Grossmann, R. – Szmyt, M. (eds.): *Transitional Landscapes? The 3rd Millennium BC in Europe*. Bonn 2016, 85–100.

KOLÁŘ, J. 2020

Migrations or local interactions? Spheres of interaction in third-millennium BC Central Europe. *Antiquity* 94/377 (2020) 1168–1185.

KÖNINGER, J. 2012

Funde und Befunde aus den Tauchsondagen 1987, 1988 und 2005 und weiteres Fundmaterial aus den Sammlungen Klaus Kiefer und Hans-Joachim Krass. In: Köninger, J. (ed): *Bodman- Weiler II – eine Ufersiedlung der Horgener Kultur vor Bodman, Kreis Konstanz.* Hemmenhofener Skripte. Freiburg 2012, 9–54.

KOSSIAN, R. 2005

Nichtmegalithische Grabanlagen der Trichterbecherkultur in Deutschland und den Niederlanden. Halle (Saale) 2005.

KRISTIANSEN, K. – ALLENTOF, M. E. – FREI, K. M. – IVERSEN, R. – JOHANNSEN, N. N. –

KROONEN, G. et al. 2017

Re-theorising mobility and the formation of culture and language among the Corded Ware Culture in Europe. *Antiquity* 91/356 (2017) 334–347.

LANTING, J. 2018

Midden-Neolitische hamerbijlen in Nederland opnieuw bekeken. In: Lanting, J. (ed.): *Combineren en Deduceren*. Groningen 2018, 33–142.

LARSSON, L. 2012

Mid Neolithic Enclosures in Southern Scandinavia. In: Gibson, A. (ed.): *Enclosing the Neolithic. Recent studies in Britain and Europe*. BAR International Series 2440. Oxford 2012, 109–123.

MADSEN, T. 1994

Rezension von Zápotocký 1992, Streitäxte des mitteleuropäischen Äneolithikums. *Germania* 72/1 (1994) 327–330.

MAIER, R. A. 1964

Die jüngere Steinzeit in Bayern. *Jahresbericht der Bayerischen Bodendenkmalpflege* 5. Bonn–München 1964–1965, 9–197.

MATUSCHIK, I. – AFFOLTER, J. – KAISER, M. – KINSKY, M. – MÜLLER, A. – PÉTREQUIN, P. 2009

Grabanlagen des frühen Endneolithikums und der späten Hallstattzeit in Jettingen-Unterjettingen ‚Hau‘, Lkr. Böblingen – ein Beitrag zur Megalithik im Flussgebiet des Neckars. *Fundberichte aus Baden-Württemberg* 30 (2009) 65–94.

MIDGLEY, M. 2007

The megalithic tombs of the north European plain. In: Joussaume, R. – Laporte, L. – Scarre, C. (eds.): *Origine et développement du mégalithisme de l'ouest de l'Europe*. Bougon 2007, 63–87.

MISCHKA, D. – FURHOLT, M. 2019

The phasing of megalithic construction activities and its implications for the development of social formations in Northern-Central German. In: Müller, J. – Hinz, M. – Wunderlich, M. (eds.): *Megaliths – Societies – Landscapes. Early monumentality and social differentiation in Neolithic Europe*. Bonn 2019, 921–938.

MØBJERG, T. – MOSE JENSEN, P. – HAMBRO MIKKELSEN, P. 2007

Enkehøj. En boplads med klokkebægerkeramik og korn. *KUML* (2007) 9–45.

MÜLLER, J. 2001

Soziochronologische Studien zum Jung- und Spätneolithikum im Mittel-Elbe Saale-Gebiet (4100–2700 v. Chr.): Eine sozialhistorische Interpretation prähistorischer Quellen. Vorgeschichtliche Forschungen 21. Rahden/Westfalen 2001.

MÜLLER, J. 2018

Social memories and site biographies: construction and perception in non-literate societies. In: Bakels, C. C. – Bourgeois, Q. P. J. – Fontijn, D. R. – Jansen, R. (eds.): *Local communities in the Big Worlds of prehistoric Northwest Europe*. Leiden 2018, 9–17.

MÜLLER, J. 2019

Boom and bust, hierarchy and balance: From landscape to social meaning – Megaliths and societies in Northern Central Europe. In: Müller, J. – Hinz, M. – Wunderlich, M. (eds.): *Megaliths – Societies – Landscapes. Early monumentality and social differentiation in Neolithic Europe*. Bonn 2019, 29–74.

PAPAC, L. – ERNÉE, M. – DOBEŠ, M. – LANGOVÁ, M. – ROHRLACH, A.B. – ARON, F. et al. 2021

Dynamic changes in genomic and social structures in third millennium BCE central Europe. *Science Advances* 7(35) (2021) :eabi6941. doi:10.1126/sciadv.abi6941.

PAPE, E. 2019

A shared ideology of death? The architectural elements and the use of the late Neolithic gallery graves of Western Germany and the Paris Basin. Bonn 2019.

RIBEIRO, A. 2018

Death of the passive subject: Intentional action and narrative explanation in archaeological studies. *History of the Human Sciences* 31 (2018) 105–121.

RINNE, C. 2003

Odagsen und Großenrode, Ldkr. Northeim: Jungsteinzeitliche Kollektivgräber im südlichen Leinetal. Rahden–Westfalen 2003.

ROBB, J. – HARRIS, O. J. T. 2018

Becoming gendered in European prehistory: Was Neolithic gender fundamentally different? *American Antiquity* 83/1 (2018) 128–147.

SCHROEDER, H. – MARGARYAN, A. – SZMYTZ, M. – THEULOT, B. – WŁODARCZAK, P. – RASMUSSEN, S. et al. 2019

Unraveling ancestry, kinship, and violence in a Late Neolithic mass grave. *Proceedings of the National Academy of Sciences* 116/22 (2019) 10705–10710.

SCHULTRICH, S. 2018

Das Jungneolithikum in Schleswig-Holstein. Scales of Transformations in Prehistoric and Archaic Societies, vol. 1. Leiden 2018.

SCHULTRICH, S. 2022

Kriegerideal und Netzwerke: Die Doppeläxte West- und Mitteleuropas im Kontext der jung- bis endneolithischen Kulturentwicklung. PhD-thesis, University of Kiel 2022.

SHERATT, A. G. 2004

Wagen, Pflug, Rind: Ihre Ausbreitung und Nutzung – Probleme der Quelleninterpretation. In: Fansa, M. – Burmeister, S. (eds): *Rad und Wagen. Der Ursprung einer Innovation. Wagen im Vorderen Orient und Europa.* Archäologische Mitteilungen Nordwestdeutschland Beiheft 40. Mainz 2004, 409–442.

SJÖGREN, K.-G. – PRICE, T. D. – KRISTIANSEN, K. 2016

Diet and Mobility in the Corded Ware of Central Europe. *PLoS ONE* 11/5 (2016) e0155083. <https://doi.org/10.1371/journal.pone.0155083>

SKEATES, R. 1992

The Neolithic and Copper Age of the Abruzzo-Marche Region, Central-Italy. Oxford 1992.

SOHN, M. 2002

Place et rôle du mobilier dans les sépultures collectives du Bassin parisien à la fin du Néolithique. *Bulletin de la Société préhistorique Française* 99/3 (2002) 501–520.

STEININGER, D. 2015

On flint and copper daggers in chalcolithic Italy. In: Friemann, C. – Eriksen, B.-V. (eds.): *Flint Daggers in Prehistoric Europe.* Oxford 2015, 45–56.

STRUVE, K. W. 1955

Die Einzelgrabkultur in Schleswig-Holstein und ihre kontinentalen Beziehungen. Offa-Bücher 11. Neumünster 1955.

VAN DER VELDE, H. M. – BOUMA, N. – RAEMAEKERS, D. C. M. 2019

A monumental burial ground from the Funnel Beaker Period at Oosterdalsen (the Netherlands). In: Müller, J. – Hinz, M. – Wunderlich, M. (eds.): *Megaliths – Societies – Landscapes. Early monumentality and social differentiation in Neolithic Europe*. Bonn 2019, 719–752.

VEIT, U. 1993

Kollektivbestattungen im nord- und westeuropäischen Neolithikum. Problemstellung, Paradigmen, Perspektiven. *Bonner Jahrbücher* 193 (1993) 1–44.

WOLF, C. 1992

Schnurkeramik und Civilisation Saone-Rhone in der Westschweiz: ein Beispiel für die Auseinandersetzung zwischen einer lokalen und einer überregionalen Kulturerscheinung. In: Buchvaldek, M. – Strahm, C. (eds.): *Die kontinentaleuropäischen Gruppen der Kultur mit Schnurkeramik. Schnurkeramik-Symposium Praha-Stirin 1990*. *Præhistorica* 19, 1992, 187–198.

ZÁPOTOCKÝ, M. 1992

Streitäxte des mitteleuropäischen Äneolithikums. Quellen und Forschungen zur prähistorischen und provinzialrömischen Archäologie 6. Weinheim 1992.

ZENG, T. C. – AW, A. J. – FELDMAN, M. W. 2018

Cultural hitchhiking and competition between patrilineal kin groups explain the post-Neolithic Y-chromosome bottleneck. *Nature Communications* 9/ 2077 (2018).

Change or continuity in burial traditions between the TRB period and the Corded Ware culture? The case of Dalfsen, a Neolithic burial ground in the Netherlands

HENK VAN DER VELDE – NIELS BOUMA

Abstract

In 2015 in Dalfsen (Netherlands), a burial ground was excavated comprising 142 single burials. Most of them belong to the last phase of the TRB (Trichterbecher or Funnel Beaker) period (3000–2750 BC), and some to the Corded Ware and Bell Beaker cultures. The results from this excavation challenge existing ideas about the cultural break between the period of the TRB and that of the Corded Ware culture in the area associated with the TRB West group. Until now, the study of the TRB period has been mostly focused on megalithic monuments, and this has led researchers to perceive fundamental differences in burial custom between the TRB and Corded Ware periods. The results from Dalfsen show that the differences may be less fundamental than was previously thought. At Dalfsen, graves from the TRB period resemble those of the Corded Ware culture in many aspects except for their ceramics, and evidence for burial mounds and secondary burials was found dating to the period preceding the earliest introduction of Corded Ware pottery in the Netherlands. All of this suggests either that there was far more continuity in burial traditions from the TRB period to the Corded Ware culture period than has been suggested by recent studies or, alternatively, that prior to the introduction of Corded Ware pottery, Corded Ware culture ideas about burial rituals were already influencing the local community of Dalfsen.

Key words: TRB period, Corded Ware culture, funerary archaeology, Dalfsen, Netherlands

Introduction

During the first centuries of the 3rd millennium BC, the Corded Ware culture (known also as the Single Grave culture or the Battle Axe culture) spread over large parts of Europe, replacing (as it did in the Netherlands) the cultural groups of the *Trichterbecher* (henceforth TRB), or Funnelbeaker, culture (Fig. 1). The debate about the nature of the Corded Ware culture has a long history, in which the resemblances between material complexes are stressed and the distribution of the Corded Ware pottery is seen as a sign of cultural unity (FURHOLT 2019). When aDNA studies on the biological ancestry of inhumations pointed to an influx of groups from the Yamnaya culture into Europe, the debate on human mobility moved into a new phase (KRISTIANSEN *et al.* 2017; OLADE *et al.* 2018; FURHOLT 2021). Today, few archaeologists question the grand narrative of groups with a steppe ancestry migrating into and through Europe. In fact, several studies interpret these migration events as the start of a new era in many parts of Europe, represented in the northern and north-western parts by the emergence of the Corded Ware culture (KRISTIANSEN *et al.* 2017; FURHOLT 2021; PAPAC *et al.* 2021). This archaeological culture replaced the TRB culture, whose members, as indicated by the results from the considerable number of inhumations analysed by means of aDNA, bear a haplo-group that they inherited from Mesolithic hunter-gatherer societies (SÁNCHEZ-QUINTO *et al.* 2019). A closer look at the material culture, however,

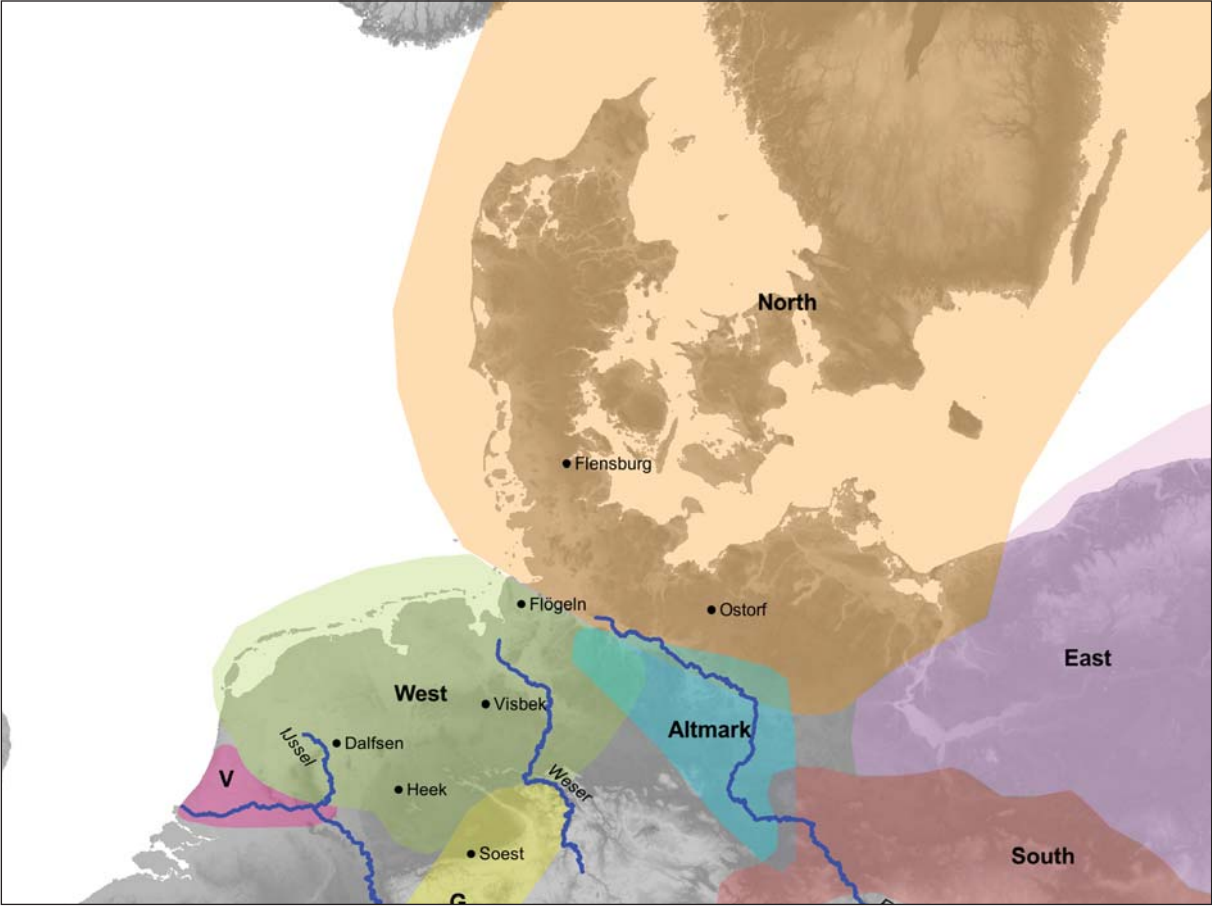


Fig. 1. TRB and Corded Ware culture groups in (northern) Europe (after BAKKER 1979)

suggests that the Corded Ware culture also represents a variety of regional cultural groups, of people who have a pottery style in common but who differ in other aspects of their (im)material culture (FURHOLT 2019). This may suggest that the explanation that everything changed due to migrations is too simple.

At first glance, the material record (almost exclusively from burials) from both cultures seems to underline the differences between them. Usually, it is the contrast between a mortuary ritual involving megalithic monuments and collective burials (TRB) and a ritual involving single burials (Corded Ware culture group) that is stressed. When an excavation at Dalfsen (the Netherlands; Fig. 2) in 2015 uncovered a burial ground with 142 Neolithic burial pits, of which 135 date to the TRB period, the study of non-megalithic TRB burials entered the debate and challenged the idea that TRB burial sites are dominated by megalithic monuments (VAN DER VELDE – BOUMA – RAEMAEKERS 2019).

Even though the buried human remains had not been preserved in the acidic soils of Netherlands, the number of burials and the layout of the excavation made it possible to study burial rituals during the last phases of the TRB period (3000–2750 BC). Furthermore, by relying on the material culture of the burials, we were also able to compare the TRB flat graves and associated burial rituals to those of the Corded Ware culture. In this contribution, we first focus on the state of knowledge before the excavation at Dalfsen and then zoom in to the results from the excavation to find out whether the development of new cultural traditions relating to the Corded Ware culture group changed burial customs as dramatically as was previously thought.

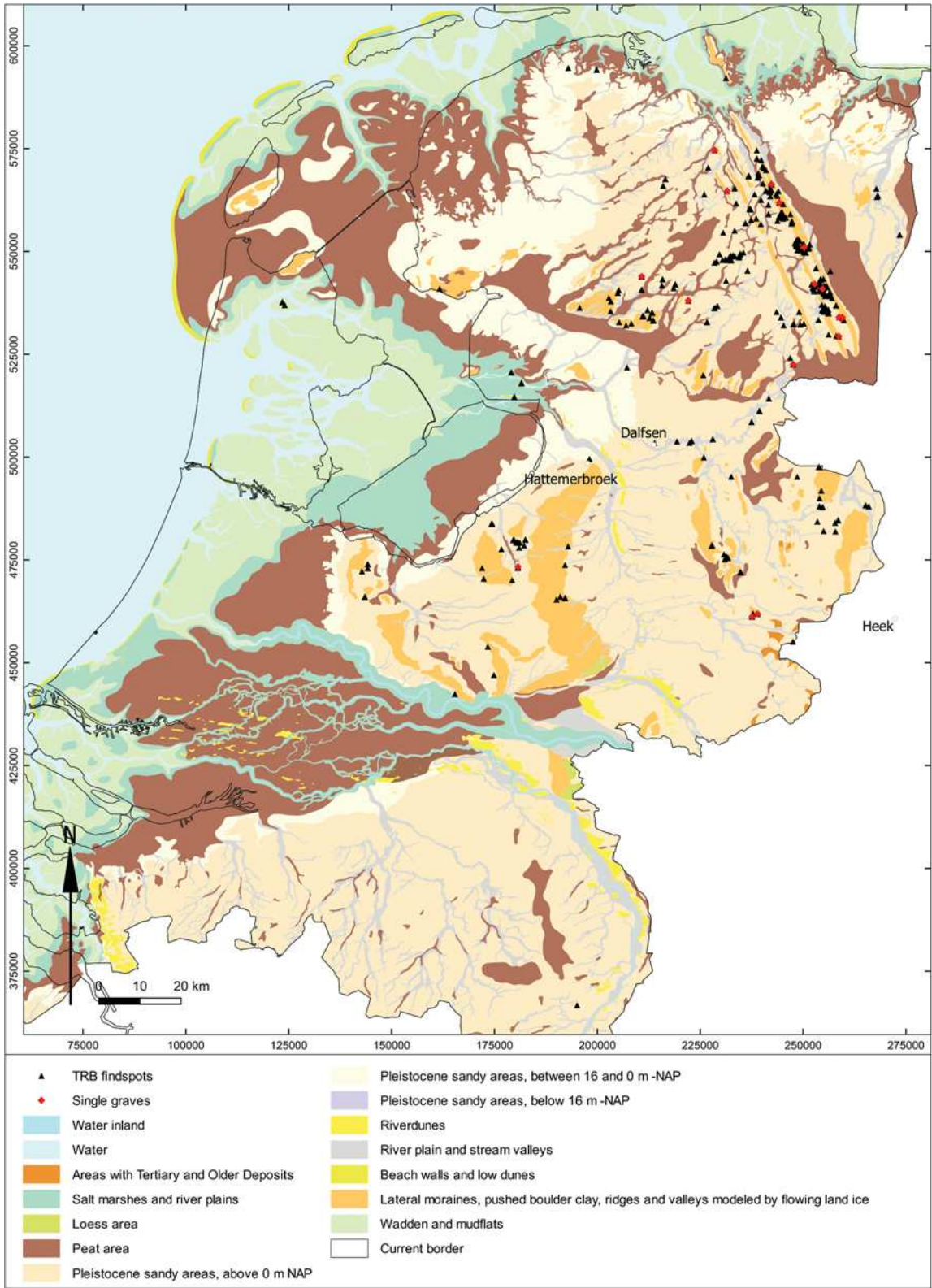


Fig. 2. Location of Dalfsen (the province of Overijssel) and other TRB period find locations in the Netherlands (ADC ArcheoProjecten)

Mainly based on typochronological research, BRINDLEY (1986) created a typology for pottery from the TRB West group that enables her (in combination with ^{14}C analyses) to date pottery within a timeframe of seven horizons, ranging from 3400 to 2750 BC. This typology (with some refinements by the same author) was used for the phasing of the Dalfsen pottery assemblage (BRINDLEY 2022). Based on that typology, the oldest TRB graves from the burial ground at Dalfsen are thought to date to around 3000 BC and the youngest TRB graves from Dalfsen, to around 2750 BC. A small number of later, non-TRB burials were also found.

We would like to make clear that we do not question the evidence from aDNA and the dramatic changes that took place in Europe with the migration of steppe-originated groups. However, in this debate, archaeologists often tend to focus on the supra-regional level and to treat cultures as homogenous groups from which archaeological evidence may be compared – even if the find locations are situated hundreds of kilometres apart. This tendency is known from the study of both the TRB culture and the Corded Ware culture (e.g. FURHOLT 2014; 2019; BOURGEOIS – KROON 2017). Here, we advocate an approach that favours focussing on more regional trends. We restrict the discussion to the TRB West group, located west of the river Weser, and in the Netherlands in particular (Fig. 2).

The chronology and typology of the Dutch Neolithic is still heavily based on the study of culture groups and the typochronological ordering of cultural material, such as flint artefacts and pottery (FOKKENS – STEFFENS – VAN AS 2016). Studies of pottery assemblages of several sites in the Western Netherlands led to the conclusion that pottery from ‘different cultures’ were found in contexts which could be chronologically ordered by ^{14}C datings (BECKERMAN 2015). This means that the timing of the end of the TRB culture in the north-eastern part of the Netherlands and the appearance of the first finds assemblages from the Corded Ware culture in that region are still a matter of debate. Estimates range from 2900 to 2750 BC (LANTING – VAN DER PLICHT 1999/2000; VAN DEN BROEKE 2005). ^{14}C dating of material from the first sites with evidence of the Corded Ware culture suggests a date from the middle of the 29th century BC onwards (LANTING – VAN DER PLICHT 1999/2000; BECKERMAN 2011/12).

Despite the advances in ^{14}C chronologies, the study of the (Dutch) Neolithic is still mainly based on a succession of cultural groups that are characterised e.g. by their pottery. However, we must be very cautious in using material culture as being representative of cultures since the latter do not represent static concepts, but rather, dynamic constructs of cultural groups (FURHOLT 2021). Indeed, the overlap of nearly 150 years in which TRB and Corded Ware pottery are found together in the same region, although not in the same find contexts, challenges the idea of a neat chronology. This means that we must acknowledge that burial traditions from both cultural groups may have influenced each other.

The TRB culture and Corded Ware culture in the Netherlands

The complex mortuary practices of the TRB culture

The first megalithic monuments, known locally as *hunebedden*, appear in the Netherlands from 3400 BC onwards, a date based on ^{14}C dates from preserved organic material recovered from within the tombs themselves (LANTING – VAN DER PLICHT 1999/2000). The use of megalithic graves had started around 3600 BC in the neighbouring areas and seem to have reached the Netherlands – locating at the fringe of the TRB world – rather late (MIDGLEY 2008; MÜLLER 2011, 15). As the archaeological dataset of the TRB culture is dominated by these megalithic monuments, this is also where most of the research has been focused. The function of those monuments is interpreted as a location for collective burials (BAKKER 1992; VAN DER VELDE – BOUMA – RAEMAEKERS 2022, 161).

The most striking element of the inventories of the megalithic burial chambers in the Netherlands is the huge number of finds – especially pots – recovered from within them. For example, the inventory of megalithic monument D53-Havelte comprises evidence for 1200 individual pots (BAKKER 1992, 57), in contrast to the inventories of megalithic monuments northeast of the river Weser, which comprise far fewer finds (MIDGLEY 2008, 139). Apart from the megalithic tombs, the dataset also comprises of a number of non-megalithic graves; three palisaded sites (Anloo, Hattemerbroek and Uddelermeer, all situated in the province of Gelderland) and several votive deposits (VAN DER SANDEN 1997). It must be noted though that not all the TRB period burials were inhumations, but cremated human bones (JÖNS – GROENENDIJK – RAEMAEKERS 2013) inhumation-size flat graves and cremation pits (BAKKER – VAN DER WAALS 1973) are also recorded from these tombs. However, apart from one excavated settlement (Bouwlust, province of Noord Holland), we know almost nothing about TRB settlement sites and daily life (RAEMAEKERS 2013; PEETERS *et al.* 2017, 157). A recent inventory by MENNENGA (2017) revealed a small number of house plans of different sizes (ranging from 8 m to 19 m in length) of which the houses with foundation trenches (as found at Flögeln and Heek) seem to be the most common type. At some of the settlement sites, flat graves have also been identified (MENNENGA 2017).

Because the study of TRB societies is largely based on evidence derived from megalithic monuments, there are a number of points we must be aware of when looking at the archaeological record. First, excavations have focused on the burial chambers and the build-up of the burial mound. This has led to detailed knowledge about the building histories and inventories but leaves us in the dark about the use of the landscape surrounding the megalithic monuments. That large-scale excavation around the tombs may be essential to increase our understanding is best illustrated by the research conducted at Söderslätt, Sweden (ANDERSSON – WALLEBOM 2013). This site provides evidence of palisaded routes of several hundreds of metres, of trenches with standing stones, of zones covered with stones, and of depositions in the neighbouring wetlands. Lack of excavations in the vicinity of the Dutch megalithic monuments means that we do not know if similar zones existed here as well.

Second, the focus on megalithic monuments has precluded any serious research on other aspects of TRB burial ritual. As a result, other features, such as burial mounds and flat graves, probably were, and still are, overlooked in archaeological and non-archaeological projects. This makes it impossible to estimate the true number of non-megalithic burials, although it is safe to say that they are heavily underrepresented in the archaeological record. An inventory of single burials compiled by KOSSIAN (2005) makes it clear that these types of burials start to appear in the first phase of the TRB period although the majority date to the more recent phases.

Third, we do not know if the TRB groups made the same differentiation that we do between megalithic and non-megalithic monuments. Apart from the availability of stones being of importance to the choices made by local groups, it may well be that earthen mounds looked as impressive to them as megalithic monuments, most of which were originally covered by earth anyway and would have looked very similar from the outside (MIDGLEY 2005). In his description of non-megalithic graves in Germany and the Netherlands, KOSSIAN (2005, 61) creates a special category for stone cists, as being part of both the megalithic and the non-megalithic traditions, indicating that the two categories are perhaps not to be interpreted as separate entities. In fact, at the site of Mander (*Fig. 3*) traces of both a megalithic monument and single burials were found (LANTING – BRINDLEY 2003/4). Finally, the fact that some cremation burials (such as that at Leer-Westerhammrich) date to the last phase of the TRB period has led researchers to believe that the burial custom changed from inhumation to cremation towards the end of the TRB period (BÄRENFÄNGER 2004; VAN GIJN – BAKKER 2005).

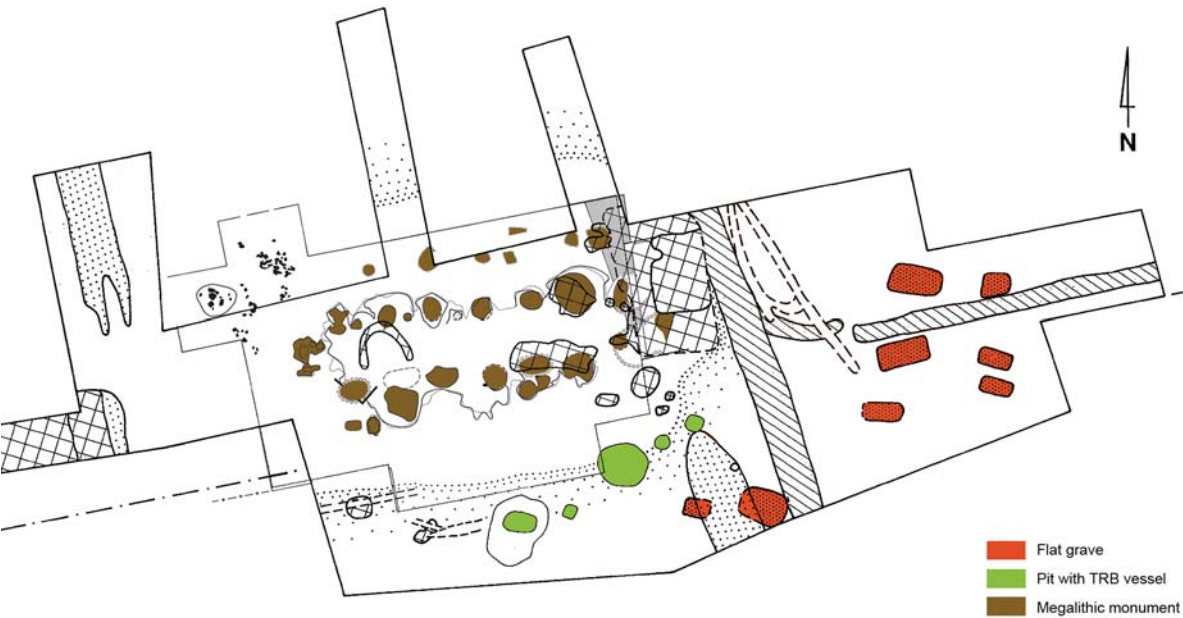


Fig. 3. Mander (province of Overijssel): traces of a megalithic monument and single burials (after LANTING – BRINDLEY 2003/4)

Corded Ware graves and funerary practices in the Netherlands

As is the case with studies on the TRB, studies on the Corded Ware culture in the Netherlands are also mainly focused on burial traditions. The burial ritual of the TRB West group involved the entire (local) community being buried together in a megalithic tomb. The end of the TRB period is seen as a watershed between collective burial and single burial (WENTINK 2020). The single burials from the Corded Ware culture group are mostly found in isolation or as part of a small group of burials (FOKKENS – STEFFENS – VAN AS 2016, 299 ff). Here we discern two main lines of research. The first encompasses the study of burials including the so-called flat graves (cf. BOURGEOIS – KROON 2017). The second addresses the archaeological evidence from burial mounds (BOURGEOIS 2013).

Regarding Corded Ware burials of north-western Europe (including the Netherlands), Bourgeois and Kroon assembled a large dataset of 1061 burials (BOURGEOIS – KROON 2017). They created a methodology to study the burial customs of this culture, based on the assumption that uniformity in ritual behaviour indicates a shared cultural background. Their research focused on the location of grave goods in relation to the position of the body, for which they used eight zones (Fig. 4). With their study, they demonstrated that the customs related to male burials were more uniform than the burial customs related to female burials.

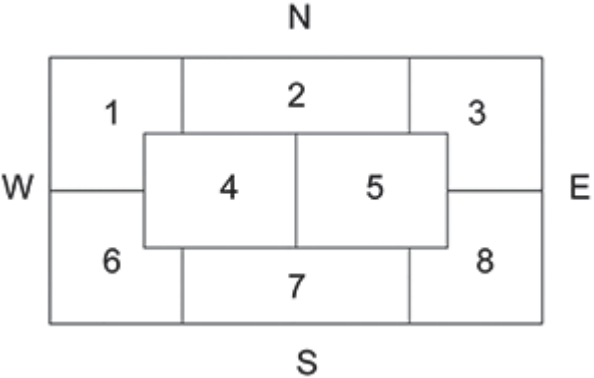


Fig. 4. The model used by Quentin BOURGEOIS and Erik KROON (2017) to code the locations of grave goods within single burials (after BOURGEOIS – KROON 2017)

The study of prehistoric burial mounds in Netherlands focuses more on the long-term development of this archaeological phenomenon (BOURGEOIS 2013). Most researchers state that the emergence of burial mounds in the research area starts in the 3rd millennium BC (BOURGEOIS 2013). In the Corded Ware culture, burial mounds played an important role in shaping the cultural landscape of that period and creating them may have been an important event in reinforcing group identity (BOURGEOIS 2013). This, not only during the first phase, involving the single (central) burial and the creation of a mound over top, but also during subsequent phases, involving secondary burials accompanied by heightening of the original burial mound (BOURGEOIS 2013). However, the relatively small numbers of burial mounds and single graves in relation to the estimated population size suggest that only part of the total population is archaeologically visible within the Corded Ware burial ritual (BOURGEOIS 2013, 12 ff).

The burial ground at Dalfsen during the TRB period

The village of Dalfsen is situated in the valley of the river Vecht. Parallel to this river, a string of coversand ridges formed, which have yielded a rich archaeological record dating from the Mesolithic to the recent periods of time (VAN DER VELDE – BOUMA – RAEMAEKERS 2022). The excavation at Dalfsen started at 2015 and led to the documentation of settlement features and burials dating to the Bronze Age and the Iron Age; a small, early medieval burial site; a high medieval farmstead; and, as mentioned already, a burial ground dating to the Neolithic period (BOUMA – VAN DER VELDE 2017; VAN DER VELDE – BOUMA – RAEMAEKERS 2022). The Neolithic burial ground was situated on two sand ridges. The southern ridge, which bordered a branch of the river Vecht that is no longer extant, yielded 135 single graves from the TRB period, whereas the northern sand ridge yielded traces of a house plan from the TRB period, as well as two single burials from the Corded Ware culture and five burials from the Bell Beaker culture (2400–2000 BC), including one covered by a burial mound (Fig. 5).

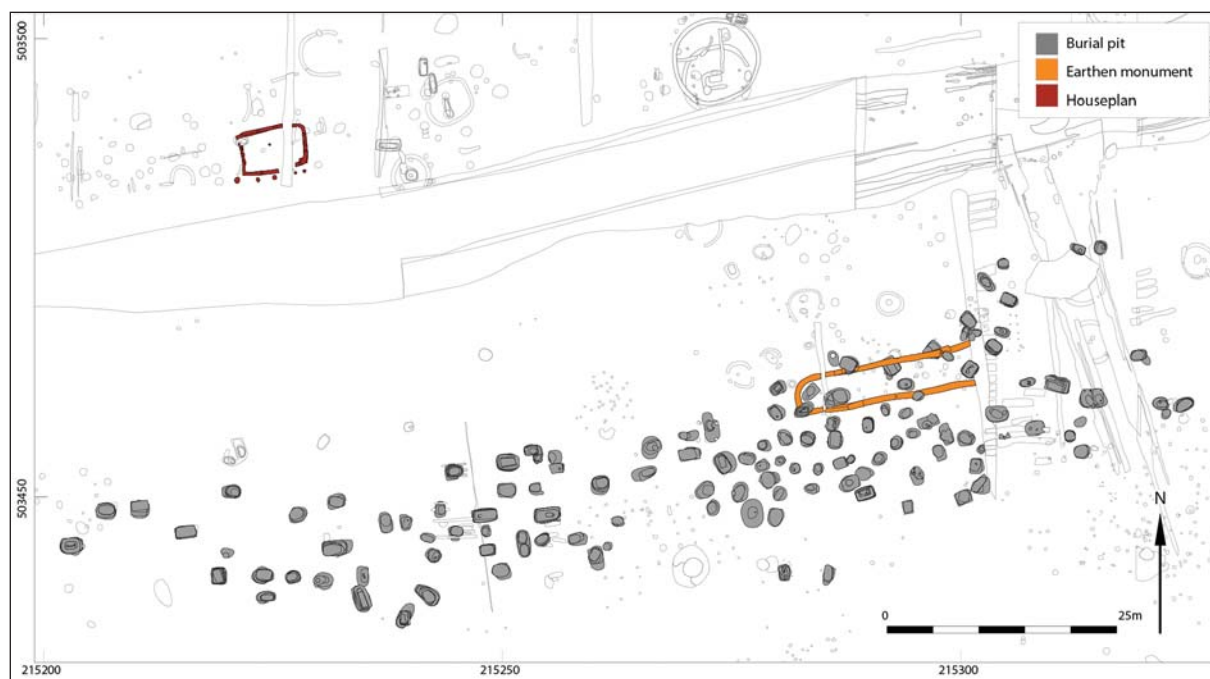


Fig. 5. Overview of the Dalfsen burial ground (ADC ArcheoProjecten)

Most of the grave pits yielded grave goods, among which pottery was the most prominent. The pottery spanned Brindley phase 4 to Brindley phase 7 (BRINDLEY 1986); we were therefore able to date the burial ground to 3000–2750 BC. Based on the grave pits that could be dated by studying the ceramics, it was possible to reconstruct the development of the layout of the burial ground. As shown in *Fig. 6*, the burial ground started with a cluster of 13 grave pits during Brindley phase 4 (3235–2975 BC). At the start of phase 5 (2975–2850 BC), new graves were added, and a monumental structure was constructed (*Fig. 7*). We were able to reconstruct three periods of use for this monumental structure. During the first phase, an oval ditch was dug, enclosing a space of 25 by 3.5 metres in which a number of pits were found. This (short-lived) phase is interpreted as a ritual monument. During the second phase of development (still corresponding to Brindley phase 5), an earthen monument was erected, and the ditch was filled in. This earthen monument became the focal point of the burial ground and people were buried in it (phase 3). It acted also as a focal point during the later Neolithic and the Bronze Age. Both the burial mound (dating to the Bell Beaker period) and the later cremation burial site (dating to the Bronze Age and the Iron Age) were focused on this earthen monument. It is interesting to note that, once this earthen monument had been added to it, the burial ground may well have had an appearance not so different from, for instance, the TRB burial ground of the above-mentioned megalithic site of Mander (LANTING – BRINDLEY 2003/4). Already during phase 5, and continuing into the succeeding phases, grave pits were dug into the earthen monument. The earthen monument gained in height as a result of this later activity, but it is difficult to establish if this was the intention or just the consequence of digging new burials into it.

Apart from the grave pits cut through the ditch of the earthen monument, no disturbances of earlier grave pits by more recent ones were recorded, so we can infer that the location of these graves must have been visible and respected by the local community who used this burial ground. Some of them may well have been covered by a mound. Although, no traces of the base of a burial mound were found, two circular structures can nonetheless be reconstructed (*Fig. 8*). At the centre of both structures was a grave pit dating to Brindley phase 4. In both cases, a ring of grave pits dating to Brindley phase 5 encircled the primary grave. It is striking that some of these secondary graves were dug to a lesser depth than the

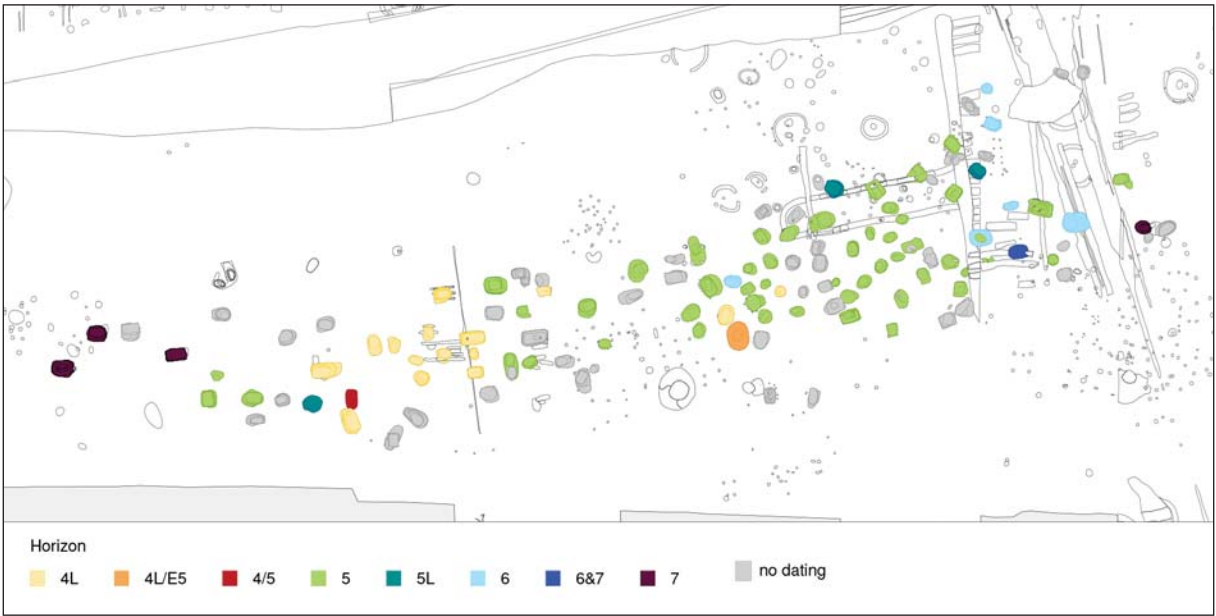


Fig. 6. Development of the Dalfsen burial ground (ADC ArcheoProjecten)



Fig. 7. Different phases of use of the Dalfsen earthen monument (ADC ArcheoProjecten)

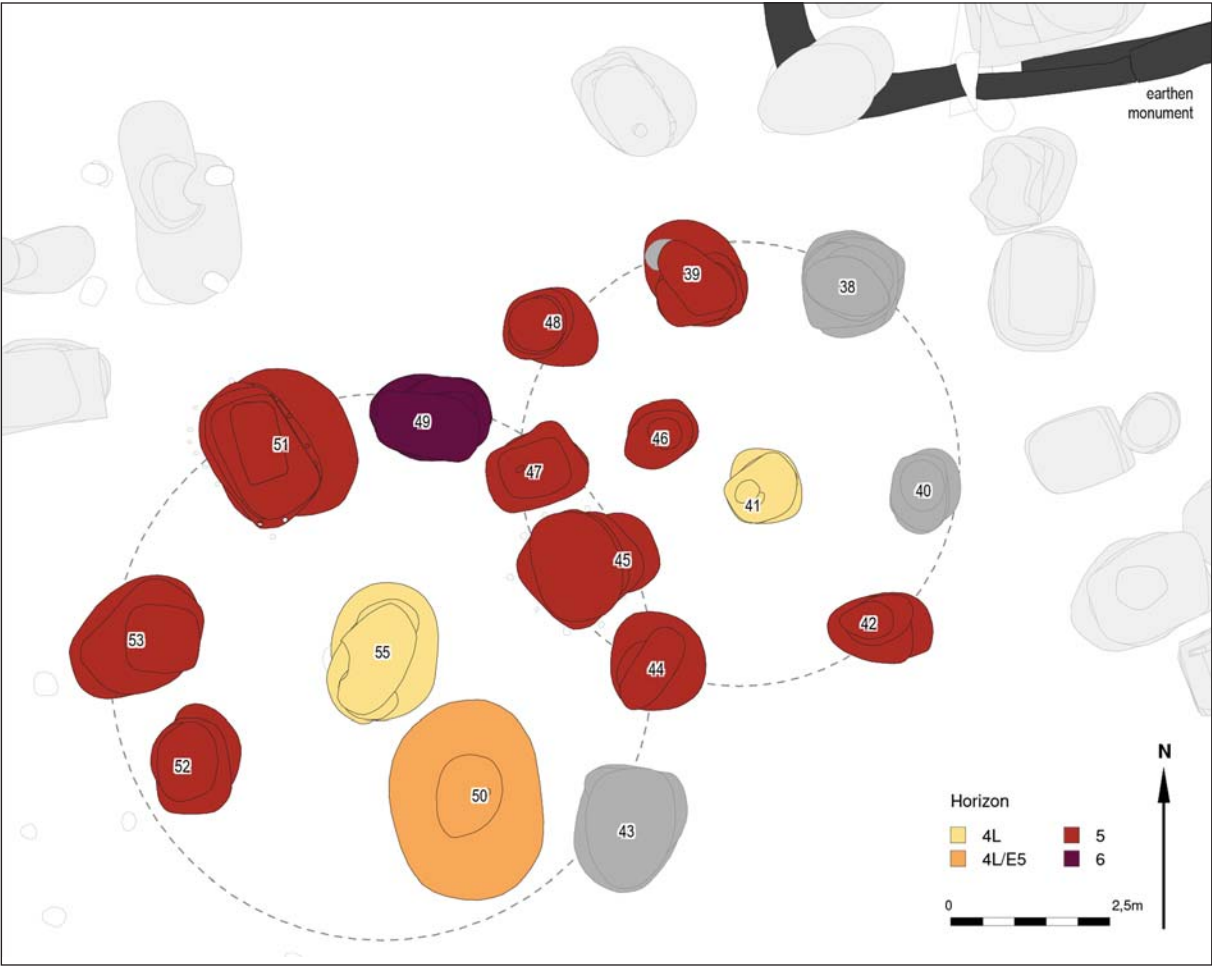


Fig. 8. Reconstruction of Dalfsen circular structures that likely represent the location of completely eroded burial mounds (ADC ArcheoProjecten)

primary, central burial. This leads us to conclude that both circular structures represent mounds in which a later generation chose to bury their dead.

Except for one cremation burial, the burials from the TRB period consisted of inhumation burials dug underground. Although no human bone was preserved, the silhouettes of the decomposed human burials were visible in a number of pits (in total 16 silhouettes were preserved). This made it possible to reconstruct the layout of some of the grave pits. Almost all silhouettes indicate that the deceased was buried in a lateral position, on their left side, with knees bent (i.e. in flexed [German: *hocker*] position). One body silhouette may represent a person laid on their right side, but we cannot be certain of this. The width of the silhouette in grave 82 suggests that the body in that grave was wrapped in a shroud. The orientation of the body silhouettes differs widely and follows the orientation of the grave pits. Whereas the orientation of the grave pits is east–west, the orientation of the body silhouettes within them varies. Body silhouettes oriented northwest–southeast and west–east comprise 50% of the total, indicating that burial with the head position in the northwest or west was relatively popular, but not prescribed. The body silhouettes are not detailed enough to say anything about the sex of the deceased. However, it is possible to estimate the body length, which may be used to distinguish between adults and children.

Most body silhouettes measured between 1.30 and 1.60 m in length, indicating the burial of adults and somewhat older children.

Based on the number of graves and on portable X-ray fluorescence (pXRF) analysis of the pottery fabric, we assume that during the TRB period, the burial ground held almost all members of the local group (RAEMAEKERS – VAN DER VELDE 2022), which we understand to mean a couple of families. This is because, apart from a few outliers, the pottery forms a remarkably uniform group, which most probably means that the raw material for almost all pots was sourced, and hence almost all pots were made, within a small region (STRUCKMEYER – VAN OS 2022). We have therefore dismissed an alternative interpretation that the burial ground was of special regional importance and that people came to Dalfsen from a wide area to bury some of their deceased, based on selection criteria unknown to us.

Although the material from Dalfsen is too small for statistical analyses, we partly applied the methodology developed by BOURGEOIS and KROON (2017) to explore the positioning of the grave goods in accordance with the buried body (BOUMA – VAN DER VELDE 2022). Due to the near absence of body silhouettes, a generalisation of the Bourgeois and Kroon approach was needed that acknowledges the uncertainty around the position of the head. We concluded that zones 1, 3, 6 and 8 represent the corners of the grave pit; zones 2 and 7 border the long axis; and zones 4 and 5 constitute the centre. We were unable to distinguish specific zones in which only one type of grave good was deposited. However, for pottery, there seems to have been a preference for the central part of the grave pit and the southeast corner. Half of the ceramics were found in the centre of the grave pits, zones 4 and 5 from the study of BOURGEOIS and KROON (2017). Zones 2 and 7, along the long sides of the pits, contain the smallest proportion of finds (6% combined). The corner zones contain c. 44% of the ceramics, and there are noticeably more in the east corners (zones 3 and 8; 29% combined) than in the west corners (zones 1 and 6; 15% combined). The two stone axes recovered from Dalfsen were both found in the eastern part of the grave.

The above-mentioned analysis was carried out using the grave pit as the spatial context, but in the graves with wooden coffins, the analysis was adapted to this more restricted space. We therefore employed a ninth zone, which is addition to the zones published by BOURGEOIS and KROON (2017): outside the coffin but inside the grave pit. This is not just a theoretical option for the deposition of grave goods: two graves (92 and 99) each yielded a pot that had been placed outside the coffin, in a separate, small pit.

Burials related to the Corded Ware culture and Bell Beaker groups at Dalfsen

On the contrary to TRB burials, we discovered only a few post-TRB burials from the Dalfsen site. These burials – consisting of seven burial pits and a burial mound – were all situated on another sand ridge, opposite the TRB burial ground. One of the grave pits dating to the Corded Ware culture was cut at the corner of a house plan from the TRB period. The oval grave pit did only contain a flint blade dated to the Corded Ware Culture. During the excavation no silhouettes were found but a closer look at the photographs from the excavation made it possible to reconstruct two silhouettes on their left, in flexed position, facing north. This location of the grave suggests that the community burying the dead recognised the layout of the building, which may mean that the interval between the last TRB burial and the first Corded Ware culture burial was not very long.

Four burials seem connected to the location of the burial mound of which only several (traces of) ring ditches were found (*Fig. 9*). In one of those ditches a small pottery fragment dating from the Bell Beaker period was found. Another fragment of Bell Beaker pottery was found in one of the grave pits.



Fig. 9. Overview of the Dalfsen Late Neolithic burial features (ADC ArcheoProjecten)

Two grave pits contained no finds nor visible silhouettes, but their form suggest that the deceased most probable were buried in a crouched position. Also, the fourth grave pit did not contain finds but features of wooden coffin were visible. This in combination with the silhouette of the head and arms suggest the deceased was positioned on its back. The location of the graves suggests, on the one hand, a continuity in burial tradition (still focused on the former TRB burial site) and, on the other hand, the creation of physical distance between the two communities. In addition, the fact that the number of burials from the Corded Ware culture and the Bell Beaker culture (as represented by a burial mound and four secondary burials opposite the earthen monument) is small, leads us to conclude that only a small proportion of the local Corded Ware and Bell Beaker culture community was buried there.

The number of post-TRB burials is too small to allow for a statistically valid comparison with the TRB burial tradition. Furthermore, because the dating of the TRB burials at Dalfsen partly overlaps the beginning of Corded Ware period in the Netherlands, Dalfsen is not the site where we can resolve questions about the end of the TRB culture and the start of the Corded Ware culture in the north-eastern part of the Netherlands either. However, the archaeological data retrieved from the burial ground at Dalfsen makes it possible to address questions about continuity and discontinuity between the TRB and Corded Ware periods. With this new evidence, we can also challenge some of the existing theories on the nature of the burial ritual of the TRB period compared with the following period.

Within the literature, most of the attention is given to the dichotomy between individual and collective burial in relation to the TRB and Corded Ware periods (VAN GIJN – BAKKER 2005). However, the Dalfsen data indicate that burials of the TRB West group may have been of a more individual nature than previously thought (RAEMAEKERS – VAN DER VELDE 2022). This is indicated not only by the single burials but also when we look more closely at the find complexes from the megalithic tombs from the TRB period. Indeed, if we compare the find complex of the total of the burial pits from Dalfsen with the find complexes from several Dutch megalithic tombs we notice similarities in the number of grave goods (RAEMAEKERS – VAN DER VELDE 2022). The number of finds compared to the years that those megalithic tombs were in use suggest similarities in burial custom where only limited number of grave goods pro person may have been the norm. This may indicate that those megalithic tombs also accommodated entire communities, and that although the deceased were buried in a collective burial chamber, the burial ritual itself was still of an individual nature (RAEMAEKERS – VAN DER VELDE 2022). Also, several single burials known from the TRB West group elsewhere pre-date even those at Dalfsen (KOSSIAN 2005). This is an indication that the custom of single burials is already part of the TRB-burial tradition before the emergence of the Corded Ware culture.

It must be noted though that burial grounds such as that at Dalfsen may also represent a regional variation on burial custom only present in the TRB West group. Indeed, even though the Dalfsen burial ground is unusual in terms of high number of graves, there are 193 find locations of single inhumation burials in the TRB West group area (KOSSIAN 2005). In other words, Dalfsen is not unusual in terms of the nature of the burial ground. Although the Dalfsen burials and Corded Ware burials in general share common ground in the tradition of a single inhumation burial, the data from Dalfsen also suggest a difference between the TRB and Corded Ware periods in the number of burials. During the TRB period, the burial ground at Dalfsen likely comprised all members of the local society and in that sense was collective in nature, something which (given the present state of knowledge) cannot be said about the burial complexes from the Corded Ware culture (BOURGEOIS 2013). For example, only some members of the society seem to have been buried underneath burial mounds while most single burials are found as solitary burials or as part of a small group of burials (BOURGEOIS 2013). Burial mounds at Dalfsen were created during Brindley phase 4, and these were subsequently reused for new burials during Brindley phase 5 (2975–2850 BC), a period with no indications for the presence of groups from the Corded Ware culture in this part of north-western Europe.

To our mind, there are three possible answers to the question about continuity or change posed in the title of this paper. The first possible answer is that, around 3000 BC, the local TRB community was influenced by new ideas about burial ritual associated with the Corded Ware culture. The community members chose to bury their dead in single burial pits and introduced the idea of constructing burial mounds. At the same time, they still used their own, TRB pottery as grave goods. The second possible answer is that these single grave burial rituals already existed in the TRB culture and that the incoming Corded Ware communities were (partly) influenced by them. This line of interpretations is supported further by the fact that the introduction of Corded Ware burials in the Netherlands took place more than a century after the first phase of the Dalfsen burial ground. The third possible answer is that Dalfsen is a burial ground in which burial traditions from both cultural backgrounds, TRB and Corded Ware, mingled and influenced each other.

Conclusions

The burial ground at Dalfsen stands out as the largest known burial ground of the TRB period containing single burials. The first phase revealed single burials containing TRB ceramics, and these burials pre-date what, until our work at Dalfsen, were the earliest known single burials – associated with the Corded Ware culture – in the Netherlands. Although there are differences between the burial customs of the TRB and Corded Ware periods within the archaeological record of the TRB burial ground at Dalfsen, we also notice similarities in the burial custom itself (position of the body, location of the grave goods) and in the creation of burial mounds.

However, on the basis of the current state of knowledge, it is not possible to conclude whether these noted similarities in burial custom can be interpreted as a sign of (regional) continuity from the TRB period into the Corded Ware period or as a first glimpse of the changes in burial custom that occurred under the influence of incoming ideas from the Corded Ware culture groups. Accordingly, more research on the (almost forgotten group of) single burials from the TRB period, alongside a programme of dating the Corded Ware burials, may help us in the near future to establish whether the archaeological record is the result of continuity, change or a mixture of both.

Acknowledgements

This contribution was made possible by a research grant from the Dutch Research Council (NWO). We would like to thank Daan Raemaekers for the discussions on the topic and Suzanne Needs for revising the English text. We also like to thank the two anonymous reviewers for their valuable comments.

References

- ANDERSSON, M. – WALLEBOM, B. 2013
Döserygg and Skegrie. Megalithic centres in south-west Scania, southern Sweden. In: Fontijn, D. – Louwen, A. J. – van der Vaart, S. – Wentink, K. (eds): *Beyond Barrows. Current Research on the Structuration and Perception of the Prehistoric Landscape through Monuments*. Leiden 2013, 115–141.
- BAKKER, J. A. 1979
The TRB West Group. Studies in the Chronology and Geography of the Makers of Hunebeds and Tiefstich Pottery. Amsterdam 1979.
- BAKKER, J. A. 1992
The Dutch Hunebedden. Megalithic tombs of the Funnel Beaker Culture. International Monographs in Prehistory. Archaeological Series 2. Ann Arbor 1992.
- BAKKER, J. A. – VAN DER WAALS, J. D. 1973
Denekamp-Angelslo. Cremations, collared flasks and a Corded Ware sherd in Dutch final TRB contexts. In: Daniel, G. E. – Kjaerum, P. (eds.): *Megalithic graves and ritual. Papers presented at the III Atlantic Colloquium, Moesgard 1969*. Copenhagen 1973, 17–50.
- BÄRENFÄNGER, R. 2004
Bestattungen der späten Trichterbecherkultur in Westhammrich bei Leer/Ostfriesland. In: Fansa, M. – Both, F. – Hassmann, H. (eds.): *Archäologie Land Niedersachsen. 25 Jahre*

Denkmalschutzgesetz—400.000 Jahre Geschichte, Begleitschreiben gleichnamigen Ausstellung, Oldenburg 14-11-2004-27-03-2005. Archäologische Mitteilungen Nordwestdeutschland Beiheft 42. Stuttgart 2004, 372–375.

BECKERMAN, S. M. 2011/12

Dutch Beaker Chronology re-examined. *Palaeohistoria* 53/54 (2011/12) 25–65.

BECKERMAN, S. M. 2015

Corded Ware coastal communities: Using ceramic analysis to reconstruct third millennium BC societies in the Netherlands. Leiden 2015.

BOUMA, N. – VAN DER VELDE, H. M. (eds.) 2017

Een geschiedenis van meer dan 5000 jaar begraven en wonen in Oosterdalsen. Een archeologische opgraving in de gemeente Dalfsen. ADC-monografie 25. Amersfoort 2017.

BOURGEOIS, Q. – KROON, E. 2017

The impact of male burials on the construction of Corded Ware identity. Reconstructing networks of information in the 3rd millennium BC. *PloS ONE* 12 (2017): e0185971. doi:10.1371/journal.pone.0185971.

BOURGEOIS, Q. 2013

Monuments on the Horizon. The formation of the barrow landscape throughout the 3rd and 2nd Millennium BC. Leiden 2013.

BRINDLEY, A. L. 1986

The typo-chronology of the TRB West group. *Palaeohistoria* 28 (1986) 93–128.

BRINDLEY, A. L. 2022

Pottery. In: van der Velde, H. M. – Bouma, N. – Raemaekers, D. C. M. (eds.): *Making a Neolithic non-megalithic monument. A TRB burial ground at Dalfsen (the Netherlands), c. 3000-2750 cal. BC*. Leiden 2022, 69–144.

FOKKENS, H. – STEFFENS, B. J. W. – VAN AS, F. M. 2016

Farmers, fishers, hunters. Knowledge generated by development-led archaeology about the Late Neolithic, the Early Bronze Age and the start of the Middle Bronze Age (2850-1500 cal BC) in the Netherlands. Nederlandse Archeologische Rapporten 53. Amersfoort 2016.

FURHOLT, M. 2014

What is the Funnel Beaker complex? Persistent troubles with an inconsistent concept. In: Furholt, M. – Hinz, M. – Mischka, D. – Noble, G. – Olausson, D. (eds.): *Landscapes, Histories and Societies in the Northern European Neolithic*. Frühe Monumentalität und soziale Differenzierung 4. Bonn 2014, 17–26.

FURHOLT, M. 2019

Re-integrating Archaeology: A contribution to aDNA Studies and the Migration Discourse on the 3rd Millenium BC in Europe. *Proceedings of the Prehistoric Society* 85 (2019) 115–129.

FURHOLT, M. 2021

Mobility and Social Change: Understanding the European Neolithic Period after the Archaeogenetic Revolution. *Journal of Archaeological Research* 29 (2021) 481–535.

JÖNS, H. – GROENENDIJK, H. A. – RAEMAEEKERS, D. C. M. 2013

Auf der Suche nach der Trichterbecherkultur/Op zoek naar de trechterbekercultuur. In: Kegler, J. (ed): *Land der Entdeckungen. Die Archäologie des friesischen Küstenraums/ Land van ontdekkingen. De archeologie van het Friese kustgebied*. Aurich 2013, 123–135.

KOSSIAN, R. 2005

Nichtmegalithische Grabanlagen der Trichterbecherkultur in Deutschland und den Niederlanden. Veröffentlichungen des Landesamtes für Denkmalpflege und Archäologie Sachsen-Anhalt-Landesmuseum für Vorgeschichte 58. Halle 2005.

KRISTIANSEN, K. – ALLENTOFT, M. E. – FREI, K. M. – IVERSEN, R. – JOHANNSEN, N. N. – KROONEN, G. et al. 2017

Re-theorising mobility and the formation of culture and language among the Corded Ware culture in Europe. *Antiquity* 91 (2017) 334–347.

LANTING, J. N. – BRINDLEY, A. L. 2003/2004

The destroyed Hunebed O2 and the adjacent TRB flat cemetery at Mander (Gem. Tubbergen, province Overijssel). *Palaeohistoria* 45/46 (2003/4) 59–95.

LANTING, J. N. – VAN DER PLICHT, J. 1999/2000

De 14C chronologie van de Nederlandse pre- en protohistorie, III: Neolithicum. *Palaeohistoria* 41/42 (1999/2000) 1–111.

MENNENGA, M. 2017

Zwischen Elbe und Ems. Die siedlungen der Trichterbecherkultur in Nordwest-Deutschland. Frühe Monumentalität und soziale Differenzierung 13. Bonn 2017.

MIDGLEY, M. S. 2005

The monumental Cemeteries of Prehistoric Europe. Stroud 2005.

MIDGLEY, M. S. 2008

The Megaliths of Northern Europe. London and New York 2008.

MÜLLER, J. 2011

Megaliths and Funnel Beakers: Societies in Change 4100-2700 BC. Amsterdam 2011.

OLALDE, I. – BRACE, S. – ALLENTOFT, M. E. – ARMIT, I. – KRISTIANSEN, K. – BOOTH, T. et al. 2018

The Beaker Phenomenon and the Genomic Transformation of Northwest Europe. *Nature* 555 (2018) 190–196.

PAPAC, L. – ERNÉE, M. – DOBEŠ, M. – LANGOVÁ, M. – ROHRLACH, A. B. – ARON, F. et al. 2021

Dynamic changes in genomic and social structures in third millennium BCE central Europe. *Science Advances* 7(35) (2021) :eabi6941. doi:10.1126/sciadv.abi6941

PEETERS, J. H. M. – RAEMAEKERS, D. C. M. – DEVRIENDT, I. I. J. A. L. M. – HOEBE, P. W. – NIEKUS, M. J. L. TH. – NOBLES, G. R. et al. 2017

Paradise Lost. Insights into the early prehistory of the Netherlands from development-led archaeology. Nederlandse Archeologische Rapporten 62. Amersfoort 2017.

RAEMAEKERS, D. C. M. 2013

Looking for a place to stay – Swifterbant and Funnel Beaker settlements in the northern Netherlands and lower Saxony. *Siedlungs- und Küstenforschung im südlichen Nordseegebiet* 36 (2013) 111–131.

RAEMAEKERS, D. C. M. – VAN DER VELDE, H. M. 2022

The Dalfsen burial ground as a means of reconstructing TRB local social organisation. In: van der Velde, H. M. – Bouma, N. – Raemaekers, D. C. M. (eds.): *Making a Neolithic non-megalithic monument. A TRB burial ground at Dalfsen (the Netherlands), c. 3000-2750 cal. BC.* Leiden 2022, 183–194.

SÁNCHEZ-QUINTO, F. – MALMSTRÖM, H. – FRASER, M. – GIRDLAND-FLINK, L. – SVENSSON, E. M – SIMÕES, L. G. et al. 2019

Megalithic tombs in western and northern Neolithic Europe were linked to a kindred society. *PNAS* 116 (2019) 9469–9474.

STRUCKMEYER, K. – VAN OS, B. 2022

Geochemical analyses of the ceramics. In: van der Velde, H. M. – Bouma, N. – Raemaekers, D. C. M. (eds.): *Making a Neolithic non-megalithic monument. A TRB burial ground at Dalfsen (the Netherlands), c. 3000-2750 cal. BC*. Leiden 2022, 145–156.

VAN DER SANDEN, W. A. B. 1997

Aardewerk uit natte context in Drenthe: het vroeg- en laat-neolithicum en de vroege bronstijd. *Nieuwe Drentse Volksalmanak* 114 (1997) 127–141.

VAN DER VELDE, H. M. – BOUMA, N. – RAEMAEKERS, D. C. M. 2019

A monumental burial ground from the Funnel Beaker period at Oosterdalfsen (the Netherlands). In: Müller, J. – Hinz, M. – Wunderlich, M. (eds.): *Megaliths, Societies, Landscapes: Early Monumentality and Social Differentiation in Neolithic Europe*. Bonn 2019, 319–329.

VAN DER VELDE, H. M. – BOUMA, N. – RAEMAEKERS, D. C. M. (EDS.) 2022

Making a Neolithic non-megalithic monument. A TRB burial ground at Dalfsen (the Netherlands), c. 3000–2750 cal. BC. Leiden 2022.

VAN GIJN, A. – BAKKER, J. A. 2005

Megalith builders and sturgeon fishers. Middle Neolithic B: Funnel Beaker culture and the Vlaardingen Group. In: Louwe Kooijmans, L. P. – van den Broeke, P. W. – Fokkens, H. – van Gijn, A. (eds.): *Nederland in de Prehistorie*. Amsterdam 2005, 281–307.

WENTINK, K. 2020

Stereotypes. The role of grave-sets in Corded Ware and Bell Beaker funerary practices. Leiden 2020.

List of contributors

Marja Ahola

Department of History, Culture, and
Communication/Archaeology
University of Oulu
P.O. BOX 8000
90014 Oulu, Finland
E-mail: marja.ahola@oulu.fi

Stefan Alexandrov

National Archaeological Institute with Museum
– Bulgarian Academy of Sciences
2 Saborna St.
1000 Sofia, Bulgaria
E-mail: stefanalexandrov@abv.bg

Jess Beck

University College Dublin, School of
Archaeology
Newman Building
Belfield Dublin 4, Ireland
E-mail: jess.beck@ucd.ie

Niels Bouma

ADC ArcheoProjecten
Nijverheidsweg-Noord 114
3812 PN Amersfoort, The Netherlands
E-mail: n.bouma@archeologie.nl

Horia I. Ciugudean

The National Museum of the Union Alba Iulia
Str. Mihai Viteazul, No. 12–14
510010, Alba Iulia, Romania
E-mail: horiaion2001@yahoo.com

Valentin Dergachev

E-mail: dergacev@mail.ru

Andrei Heroiu

SC Banat Archaeosave SRL
Str. Calea Martirilor 1989, No. 1–3–5
300724 Timișoara, Romania
E-mail: aheroIU@gmail.com

Svetlana Ivanova

Institute of Archaeology, National Academy of
Sciences of Ukraine
12 Volodymyr Ivasiuk av.
04210 Kyiv, Ukraine
E-mail: svi1956@gmail.com

Alexey Kazarnitsky

E-mail: kazarnitski@mail.ru

Olga Kuznetsova

E-mail: olga-kuznetsova0@mail.ru

Nadezhda Leonova

E-mail: nvleonova@mail.ru

Alexey G. Nikitin

Department of Biology, Grand Valley State
University
1 Campus Drive, Allendale
MI 49401, USA
E-mail: nikitin@gvsu.edu

Jaroslav Peška

Archaeological Centre Olomouc
p. o. U Hradiska 42/6
779 00 Olomouc, Czech Republic
E-mail: peska@ac-olomouc.cz

Radu Petcu

The Museum of National History and
Archaeology
Piața Ovidiu, No. 12
900745 Constanța, Romania
E-mail: radupetcuarheo@gmail.com

Bianca Preda-Bălănică

Department of Cultures, University of Helsinki
P.O. Box 4 (Fabianinkatu 24, 121C),
00014 Helsinki, Finland
E-mail: bianca.preda@helsinki.fi

Colin P. Quinn

University at Buffalo, Department of
Anthropology-Ellicott Complex
380 Fillmore Academic Center
Buffalo, NY 14261, USA
E-mail: cpquinn@buffalo.edu

Sebastian Schultrich

Institute of Pre- and Protohistoric Archaeology
Christian-Albrechts-Universität
Johanna-Mestorf-Straße 2-6
D-24118 Kiel, Germany
E-mail: sschultrich@roots.uni-kiel.de;
sschultrich@sfb1266.uni-kiel.de

Masao Semmoto

The Ancient Orient Museum, Tokyo
3-1-4, Higashi-Ikebukuro, Toshima-ku
170-8630 Tokyo, Japan
E-mail: semmoto@orientmuseum.com

Vyacheslav Sevastyanov

E-mail: vsev@geokhi.ru

Natalia Shishlina

E-mail: nshishlina@mail.ru

Cristian Eduard Ștefan

Vasile Pârvan Institute of Archaeology
Calea 13 Septembrie, no. 13, sector 5
050711 Bucharest, Romania
E-mail: cristarh_1978@yahoo.com

Martin Trautmann

A und O – Anthropologie und Osteoarchäologie
Dall'Armstraße 16,
80638 München, Germany
E-mail: ao.anthropologie@googlemail.com

Claes Uhnér

Museum of cultural history
Postboks 6762, St. Olavs plass
0130 Oslo, Norway
E-mail: c.o.j.uhner@khm.uio.no

Todor Valchev

Regional Historical Museum in Yambol
Str. Byalo more 2
8600 Yambol, Bulgaria
E-mail: tvvulchev@gmail.com

Gabriel Vasile

Vasile Pârvan Institute of Archaeology
Calea 13 Septembrie, no. 13, sector 5
050711 Bucharest, Romania
E-mail: gsvasile@yahoo.com

Henk M. van der Velde

ADC ArcheoProjecten
Nijverheidsweg-Noord 114
3812 PN Amersfoort, The Netherlands
E-mail: h.vandervelde@archeologie.nl